TEXAS HIGHWAY DEPARTMENT

Construction & Maintenance

BULLETIN No. 8

Sept. 1951

"STOP"
CONSTRUCTION AHEAD"

Foreword

This bulletin is published for the purpose of presenting practical information applicable to current highway problems. These conclusions and data are not necessarily endorsed by the Highway Department nor are they to be construed as instructions. Employees are invited and urged to submit suggestions and relate experiences which would benefit those engaged in the construction and maintenance of highways.

Photographic services are available and other assistance may be obtained if desired in preparing material for submission. All material and comments should be directed to the Chief Engineer, Construction & Maintenance, Austin, Texas.

Published Jointly by

Maintenance Division	D- 3
Equipment & Procurement Division	D- 4
Construction Division	D- 6
Traffic Services Division	D-16

COMPILED AND EDITED
INFORMATION SECTION,
TRAFFIC SERVICES DIVISION
REPRODUCED
OPERATIONS DIVISION
TEXAS HIGHWAY DEPARTMENT
AUSTIN 14, TEXAS

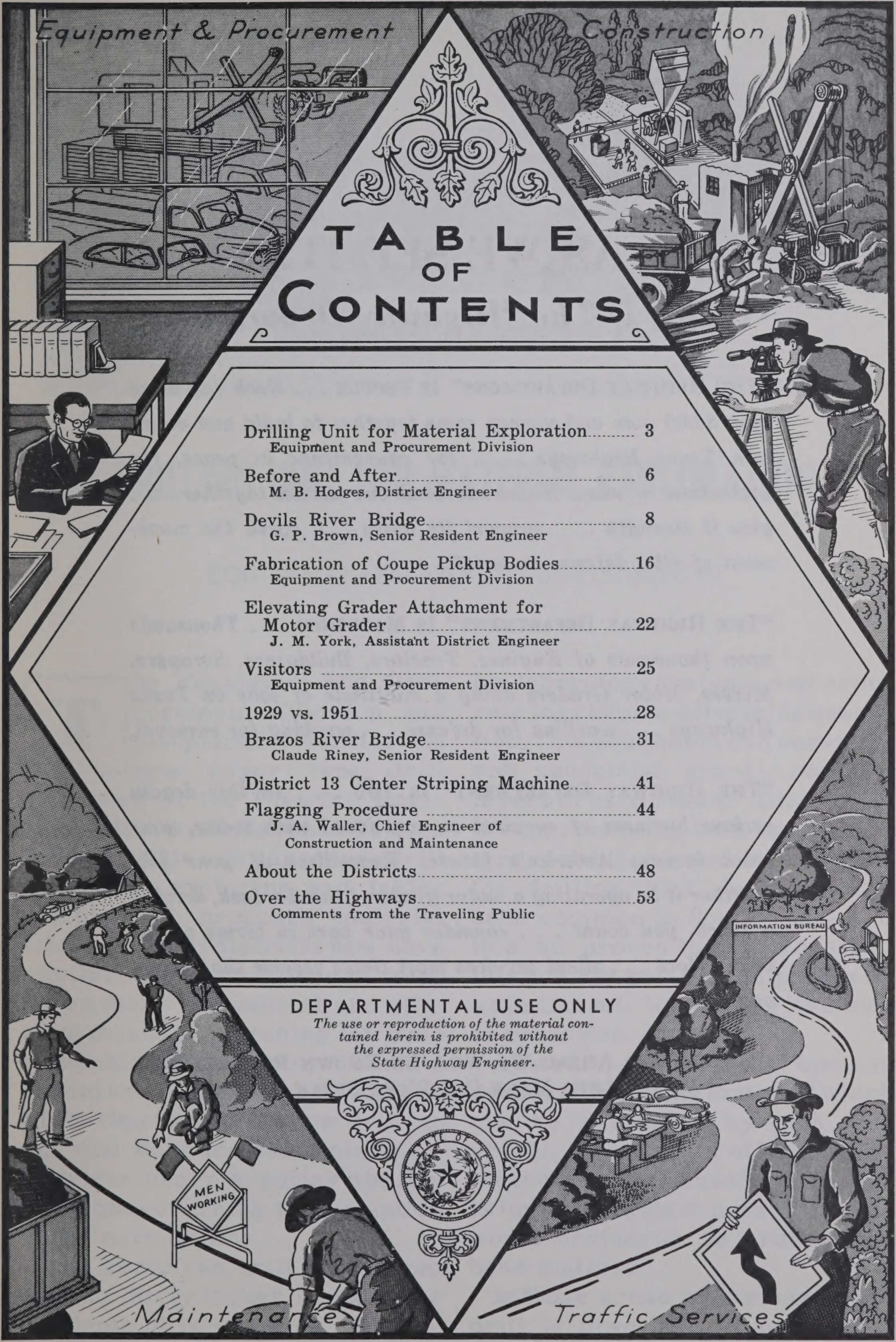


TABLE OF CONTENTS

Drilling Unit for Material Exploration 3
Equipment and Procurement Division

Before and After 6
M. B. Hodges, District Engineer

Devils River Bridge 8
G. P. Brown, Senior Resident Engineer

Fabrication of Coupe Pickup Bodies 16
Equipment and Procurement Division

Elevating Grader Attachment for Motor Grader 22
J. M. York, Assistant District Engineer

Visitors 25
Equipment and Procurement Division

1929 vs. 1951 28

Brazos River Bridge 31
Claude Riney, Senior Resident Engineer

District 13 Center Striping Machine 41

Flagging Procedure 44
J. A. Waller, Chief Engineer of Construction and Maintenance

About the Districts 48

Over the Highways 53
Comments from the Traveling Public

DEPARTMENTAL USE ONLY

The use or reproduction of the material contained herein is prohibited without the expressed permission of the State Highway Engineer.

AS WE SEE IT!

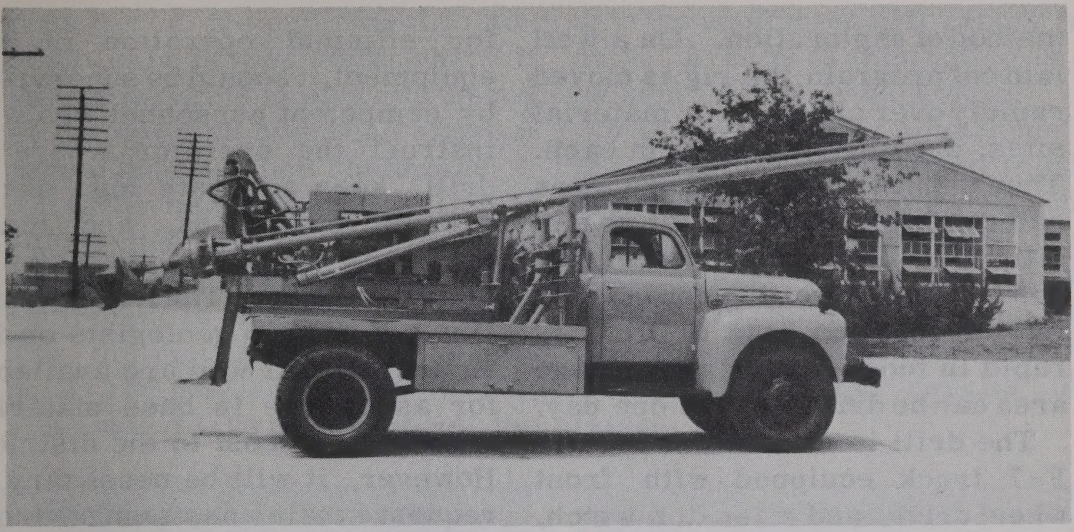
---*This Is The "Highway Department"*

"The Highway Department" Is People . . . *Each day more than 8,000 men and women come together to build and maintain Texas Highways . . . for convenience in peace, for protection in war. Highways bind our nation together . . . give it strength . . . support its unity . . . speed the movement of vital defense materials.*

"The Highway Department" Is Machines . . . *Thousands upon thousands of Engines, Tractors, Bulldozers, Scrapers, Mixers, Motor Graders doing a multitude of jobs on Texas Highways . . . working for defense . . . working for survival.*

"The Highway Department" Is You . . . *In this deadly serious business of survival we are faced with today, your work insures America's future. Regardless of your job, whether it be operating a motor grader, behind a desk, driving a truck, you count . . . consider your part in terms of the total effort . . . silent services most times receive the loudest acclaim.*

In The Days Ahead We Will Be Known By The Work We Do. Let's Make Our Work Speak Loudly.



DRILLING UNIT FOR MATERIAL EXPLORATION

EQUIPMENT AND PROCUREMENT DIVISION

The Equipment and Procurement Division has just placed in service the new auger type drill discussed at the District Engineers Meeting in March at College Station. This new auger type drill is used in exploring and taking samples of proposed material sites. Several districts now have similar drills which are proving to be a more economical and efficient means of searching for base material. Since many districts cannot use a drill such as this on a full-time basis, the new drilling rig will be made available to all districts under a policy similar to the one governing the operation of the core drills.

The auger can drill holes from eight to thirty inches in diameter to a depth of twenty feet. Representative samples may be taken for laboratory analysis and accurate logs kept to determine quantities. This equipment can penetrate soft sandstone, gravel, and thin layers of hard stone. District 16 is experimenting with the special type rock bit on a similar machine for drilling thick, hard, caliche beds common in South Texas. If this bit proves to be successful, this new rig will be equipped with a similar bit, increasing its scope of operation.

As a rule, the drill will operate successfully in any material which can be excavated by pick and shovel. It loses its efficiency as the material becomes harder, and is impracticable in materials that would ordinarily be crushed for base material.

In those areas where use of the drill is practical, it provides a fast, thorough, and economical method of exploration. On a well laid out program, the rig is moved rapidly over all possible material sites, drilling a few holes in each. Then it is returned to those sites selected as having the best possibilities and the exact quantities determined. After the drill moves into a location, the drilling is rapid in most cases, and a large area can be drilled out in one day.

The drill is mounted on a Ford F-7 truck equipped with front wheel drive, and a ten-ton winch, which makes it possible to get the equipment into many locations that would be otherwise inaccessible.

The Road Design Division, File D-8, will be responsible for routing the equipment to the districts. All requests for the auger drill should be directed to File D-8.

The Equipment and Procurement Division, File D-4, will be responsible for the equipment and an operator. Correspondence regarding these two functions only should be directed to File D-4. All other correspondence should be addressed to File D-8.

When the equipment and operator are assigned to a district, they shall work under the District Engineer, or his authorized representative, and the district will be fully responsible for routing the equipment within the district and for supervising all of its operations. Repairs to the equipment will be made in the district shop. If assistance is needed from Camp Hubbard, D-4 will send a trained mechanic together with the necessary repair parts to the location of the drill.

Past experience indicates that for efficient operation of the equipment, it should be supervised by competent personnel who will instruct the operator where to drill, keep accurate logs of the drilling operations, and make decisions as to the necessity of taking samples. The Road Design Division has two geologists on its research staff who are available for assistance in base material surveys at no cost to the district. However, it will be necessary to request their assistance from File D-8 in time for them to complete their preliminary field work and locate the areas to be investigated before the drill arrives on the project.

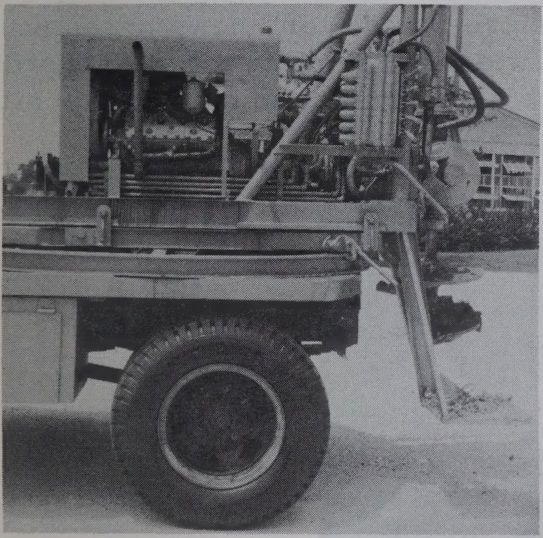
Rental charges of $6 per hour will be made against the district appropriations for actual drilling time and standby time. Actual drilling time will be construed as the time from arrival of the rig on a site, to the time the rig leaves the site, excluding time lost due to inclement weather, equipment breakdowns, or time off for the operator. Standby time will be construed as any time the drill and operator are at a location designated by the district and ready to work, but unable to do so for reasons other than those stated above.

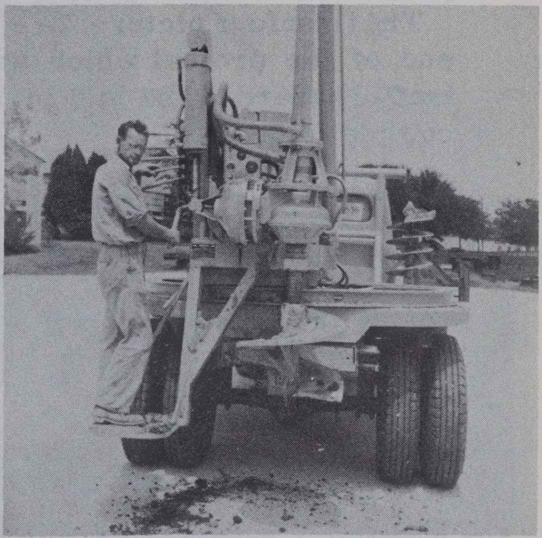
In order to keep the charges at the very low rate of $6 per hour, which includes rental of equipment, one operator, and all expenses, it will be necessary for the district to furnish a helper for the driller.

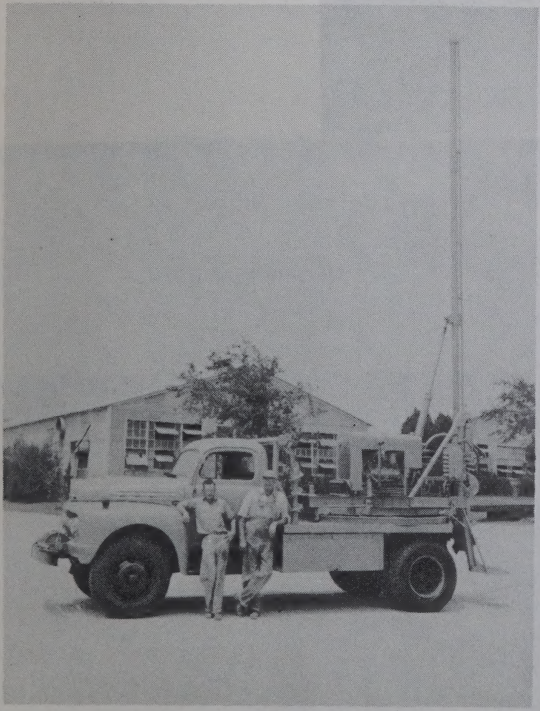
In case of extended periods of inclement weather, when the equipment cannot work, D-8 should be contacted for possible transfer of the equipment to another part of the state where it may be possible to work and thereby cut down on overhead expense occasioned by such shutdowns.

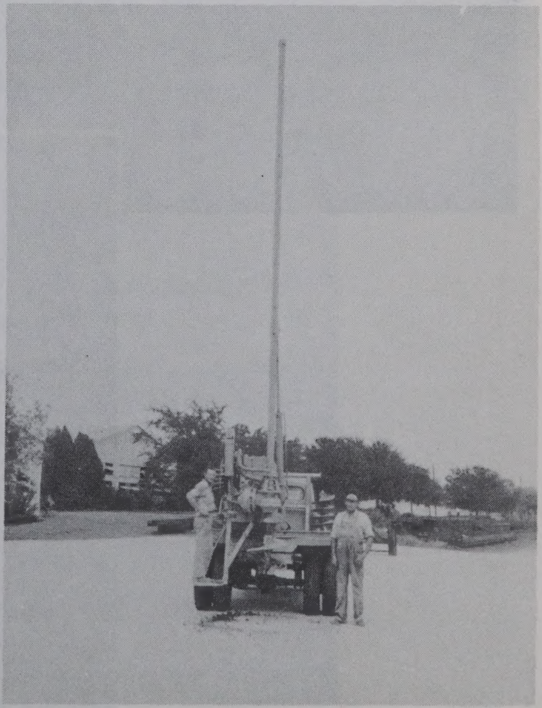
It is the intention of File D-8 to advise the district in which the drill is operating as to where the equipment is due to report next. The district shall in all cases notify the next scheduled district at least two days in advance of the date the equipment will report for duty. A copy of this notice is to be sent to File D-8, Austin.

It is believed that adherence to the above procedure regarding the operation of this equipment will result in more efficiency, and possibly lower rental rates on the same. In future bulletins we will report on the operation of this drill and the results obtained.







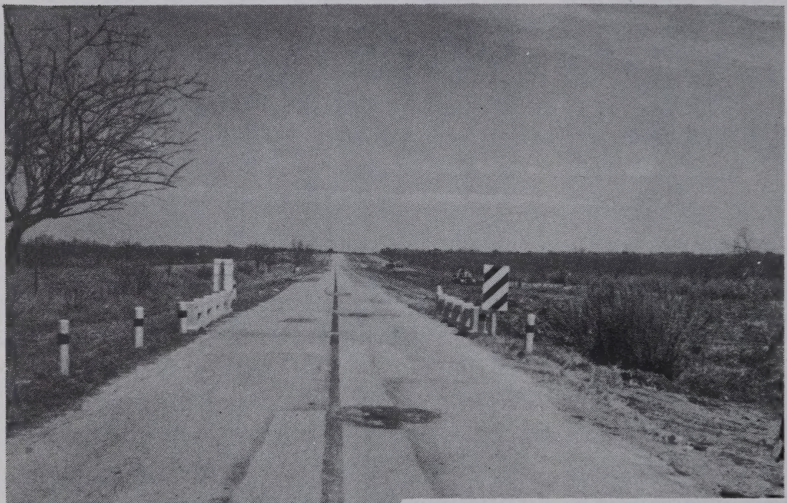


BEFORE and AFTER

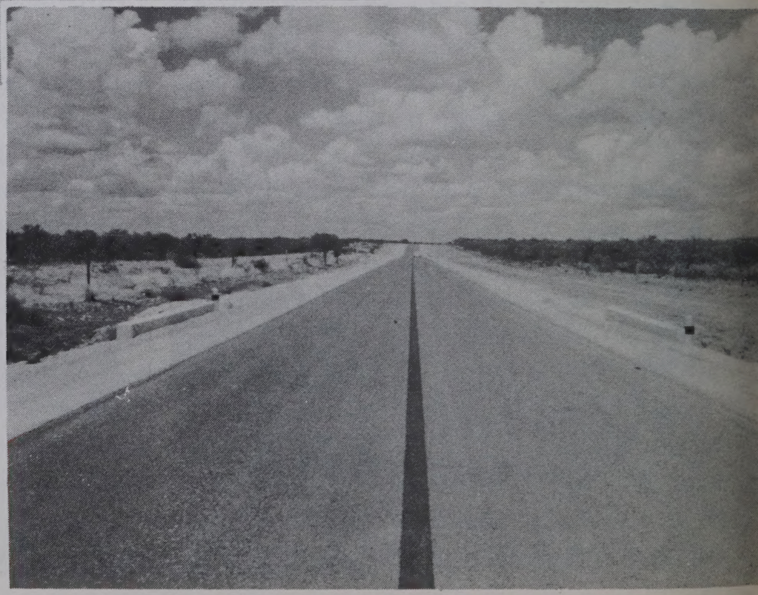
Submitted by M. B. HODGES
District Engineer

The following pictures were made of work accomplished under the 1951 Asphalt Betterment Program on U. S. 83 in Zavala County, project number L 37-3-21.

The first four pictures are "before" and "after" views of the south end of the project which was widened, eliminating a dangerous traffic hazard. The last picture shows a section of roadway after completion.

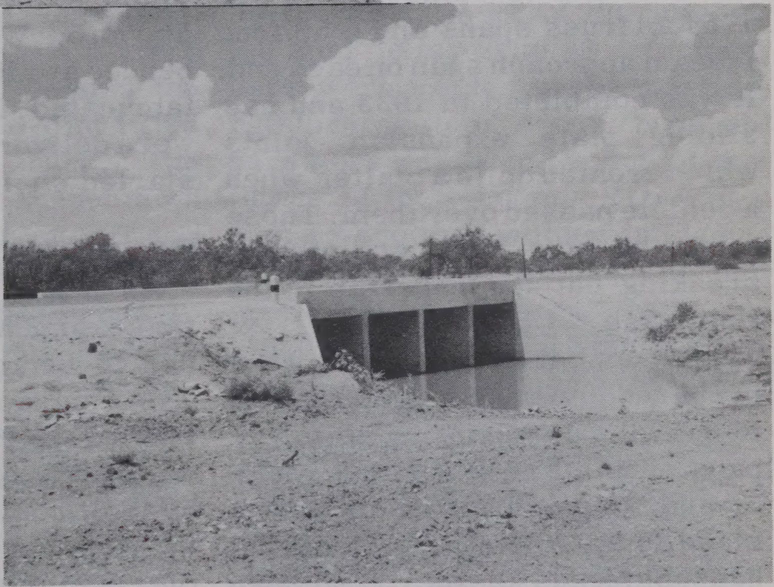


Before

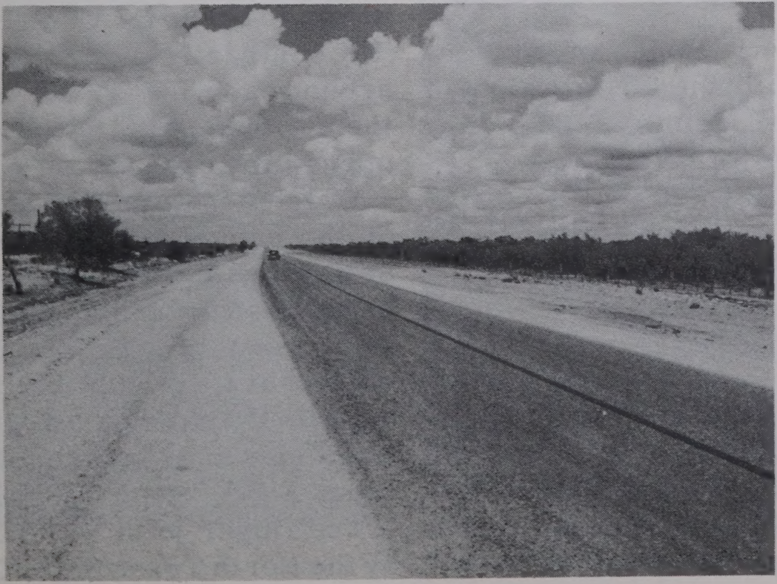


After

Before



After



Finger Joint Installation

DEVILS RIVER BRIDGE

G. P. BROWN
Senior Resident Engineer

DESCRIPTION:

The Devils River Bridge is located about twelve miles west of Del Rio and is composed of six 175 foot truss spans and a 58 foot I-beam approach span on each end. It was completed in 1933 and had sliding plate expansion joints which created quite a clatter when a vehicle passed over them. These joints became loose and started breaking out the concrete in the floor slab.

In December, 1950, plans were prepared by the Bridge Division to replace the existing plate expansion joints at piers 1, 2, 3, 5 6, and 7 with finger joints and to make an open joint at pier 4 as it had both ends of the truss span fixed.

Bids were received on January 23, 1951, for the installation of these finger joints. They are tabulated as follows:

Southern Contracting Co., Austin ..	$17, 951. 80
Norman L. Larsen, Austin	19, 369. 00
Jack Freeland, San Antonio.......	22, 004. 00
Cage Brothers, San Antonio.......	22, 672. 00
George Kies, Austin	33, 370. 40

Southern Contracting Company was awarded the contract on January 29, 1951, making the low bid plus Engineering and Contingencies $19,746.98 and the Engineer's estimate was $23, 000.

Work Order was issued by the District Engineer on February 19, 1951, advising that working time would start fifteen days later on March 5. Working time was suspended awaiting the delivery of the fabricated finger joints. They were delivered on July 2, and work started on July 3.

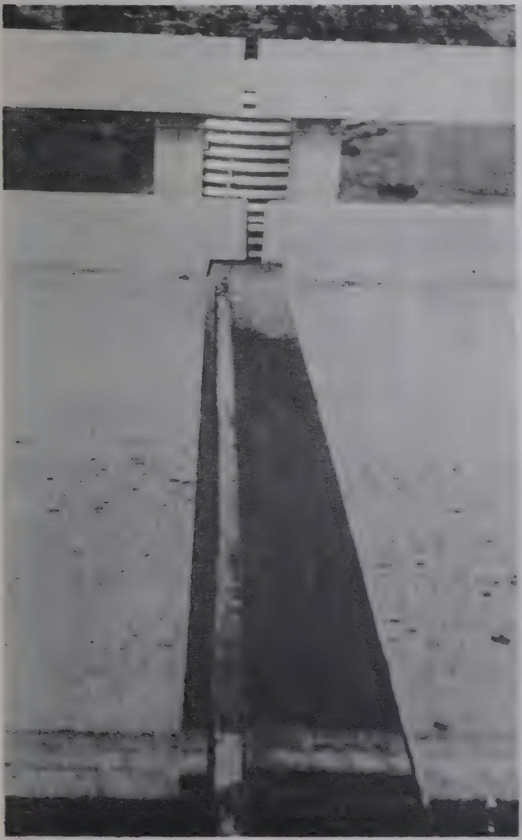
CONSTRUCTION METHODS:

As it was impossible to detour traffic around the bridge, one lane had to be kept open at all times. The contractor placed the usual standard barricades and warning signs. They were supplemented by additional barricades and signs to properly direct the traffic by the maintenance department as directed by the District Engineer. The contractor placed barricades around each area of work and kept them in place until that lane was opened to traffic.

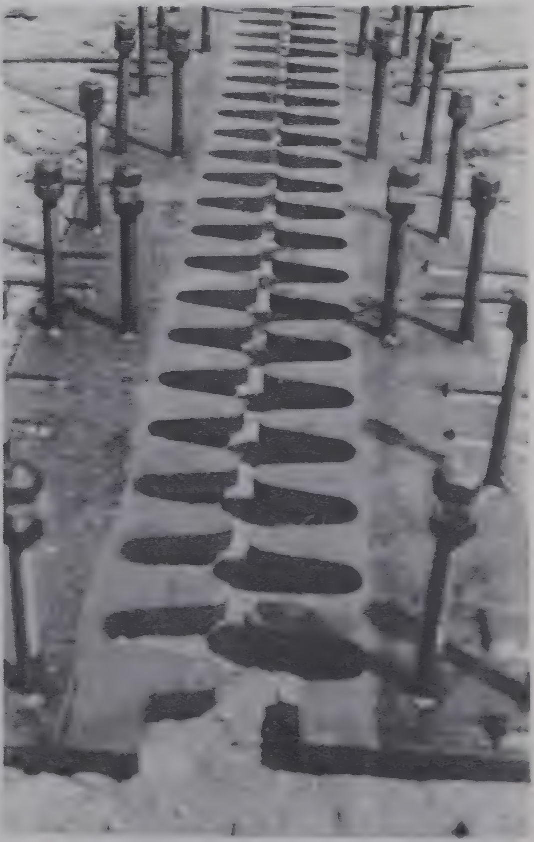
Watchmen were kept at each end of the bridge for 24 hours a day, seven days a week until the entire bridge was opened to traffic. Traffic across this bridge normally travels at a very high rate of speed but with the barricades, signs, and watchmen used, no trouble developed.

The finger joint was fabricated by the North Texas Steel Company of Fort Worth and cut into at the center line so that it could be placed in half widths. The stud bolts, #5 x 7" deformed bars, 2" x 5/16" x 1'7" bars and the #5 x 21" deformed bars were all attached to the plate in accordance with the plans in the shop of the steel company. The angles were drilled and the stiffener plates were cut in the shop also. All of this material was trucked to the job by the steel company.

The old concrete was broken out two feet, six inches on each side of the joint with paving breakers. The plate was cut into with a torch about twelve inches beyond the center line, and the old joint lifted out with an A-frame truck. The flange at the top of the I-beam on the approach span was cut off and the 4" x 4" angles welded on. The 8" x 8" angles were then bolted onto the 4" x 4" angles. On the truss span the 8" x 4" angles were welded to the top of the floor beam. The spacing between the 8" x 8" and the 8" x 4" angles was set according to the temperature at the time of the installation. The locations of the holes in the top of the flange of the floor beam were carefully measured and marked with a center punch and drilled with a pneumatic drill. The finger joint section was lowered into place and adjusted to fit the crown by the adjustment of the nuts on the stud bolts. The #5 deformed bars were welded to the existing reinforcing steel, and the two inch bars were welded to the top of the flange of the I-beam. The stiffeners were then welded in place. The forms were placed and the



Existing plate expansion joints.



Proposed finger joint.

concrete poured. The concrete was Class "A" and poured very dry with slump less than one inch. Approximately a half sack of cement was added to each yard of concrete in an attempt to get high early strength. The concrete was worked under the plate with a small vibrator. Three beams were taken of each pour and were broken at three, five, and seven day intervals with the following averages: three day, 623; five day, 640; and seven day, 688. Each joint was opened to traffic after three days of curing with wet mats as each three day beam broke over 500 pounds. All new steel and the existing steel that had been defaced during construction were given two coats of aluminum paint.

Work was completed on July 26, 1951, with the contractor using only 20 of the 45 working days provided.

GENERAL REMARKS:

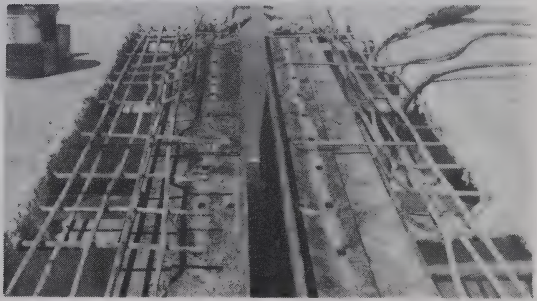
The design of this finger joint is very good as it is easy to fit the crown of the existing bridge. The fabrication of the joint by the North Texas Steel Company was excellent as everything fit perfectly. Some difficulty was encountered in determining the proper spacing of the angles according to the temperature because the sunny side of the bridge expanded more than the shady side, and the floor beam had a considerable "bow" during the heat of the day while in the early morning it was straight. Some depression was noted in the joint when a heavy loaded truck passed over it, which stiffeners from the bottom of the 8" x 4" angles to the bottom flange of the floor beam might help.

Breaking out old joint.

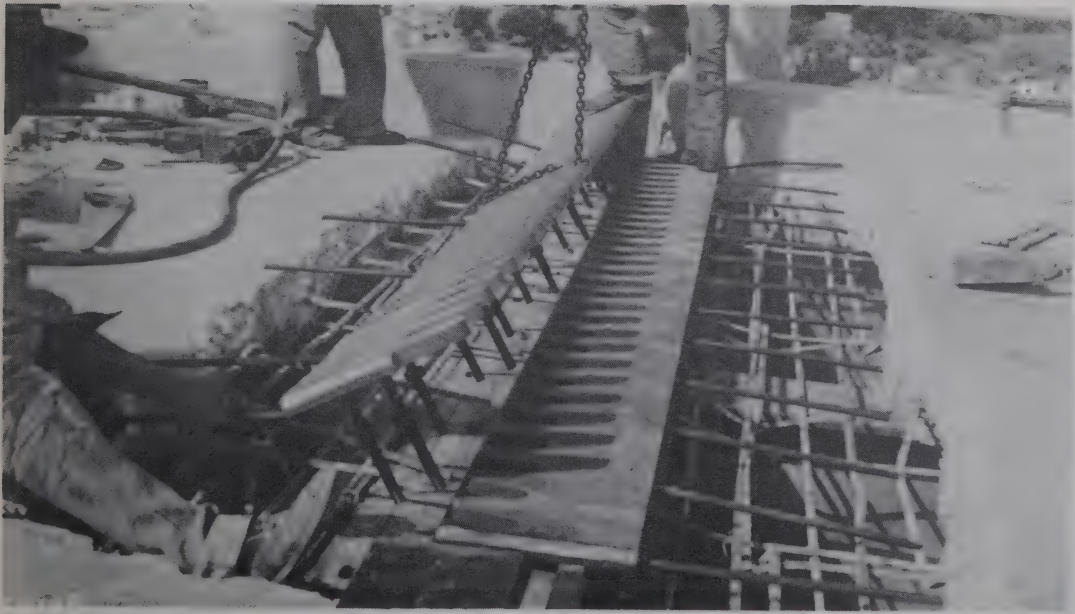
Removing old joint.

After removal of old joint.

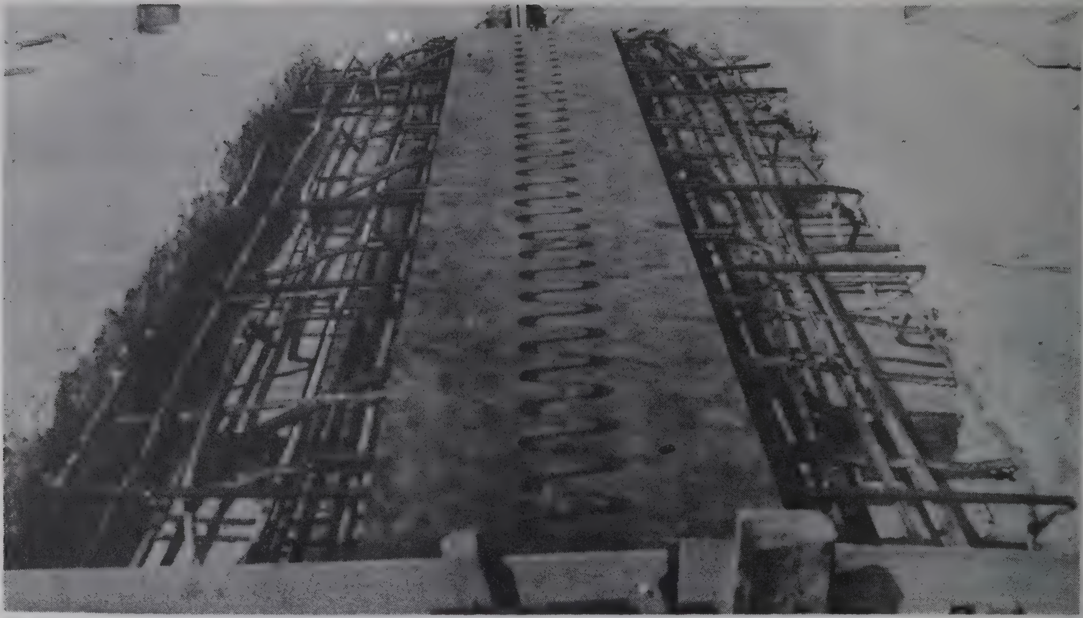
Concrete Removed and angles placed, Pier 1.



Concrete removed and angles placed, Pier 2.

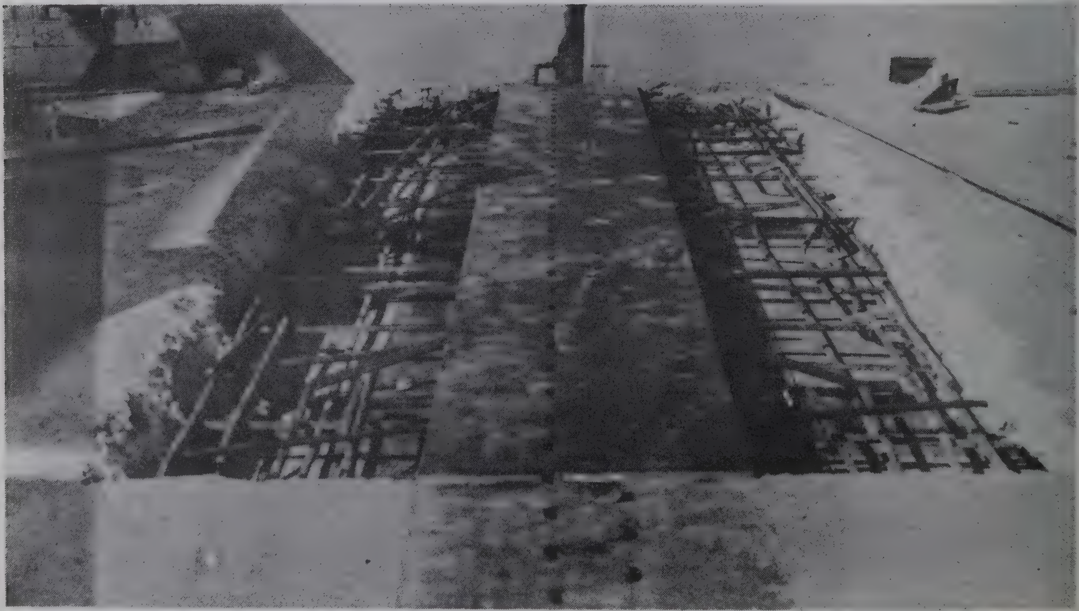


Placing finger joint.



One-half finger joint in place.

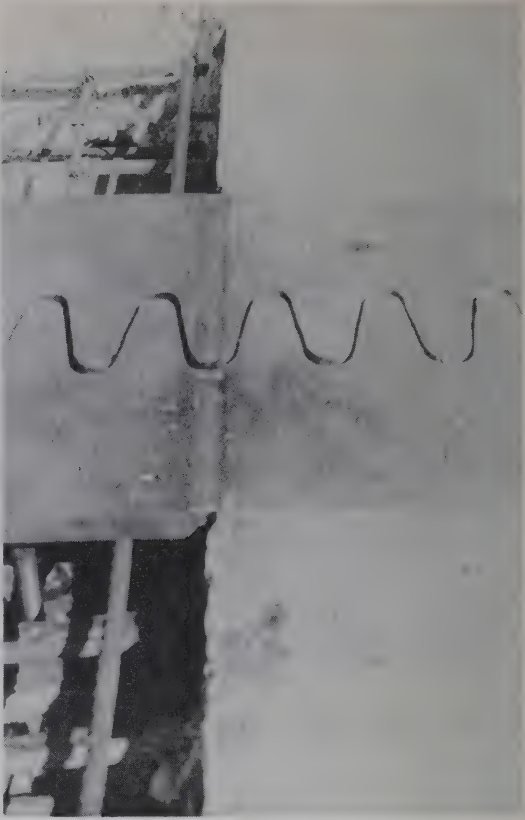
Whole finger joint in place.



Pouring concrete.

Using vibrator to work concrete under plate.

Completed finger joint.



Finger joint welded together at center line.

Pier 4, one-half joint in place.

Pier 4, one-half existing joint cut.

HELPFUL HINTS . . .

Now that we have roadside parks with us it is of paramount importance that they be kept clean and orderly so that we and the tourists alike may enjoy them. It is common knowledge that some of the parks in existence are difficult to maintain. Regardless of the amount of effort placed into the cleaning of them, they always look unsightly. Other parks and table units have a neat and snappy appearance until some uncouth customer leaves his lunch or watermelon scattered all over the landscape. Anything that we can do to minimize the work and cost of keeping these table units is welcomed. One such helpful hint was developed by Mr. J. E. Black, Maintenance Foreman at Brady. It is in the form of a sign stenciled on the top of each table, and reads as follows:

> WE HOPE THE PREVIOUS USER CLEANED UP BEFORE LEAVING THEREBY MAKING YOUR STOP MORE ENJOYABLE.
>
> TEXAS HIGHWAY DEPARTMENT

Anyone using one of these tables is reminded of cleaning up before occupying the table. The effect of this sign is proving very noticeable. Rarely will a table unit be found littered with picnic remains that has one of these signs stenciled on it.

FABRICATION OF COUPE PICKUP BODIES

EQUIPMENT AND PROCUREMENT DIVISION

For the past fifteen months we have purchased tool pusher (pickup) bodies for business coupes on competitive state-wide bids for about 90 per cent of the districts. The other districts have been fabricating these bodies in their own shops with great success.

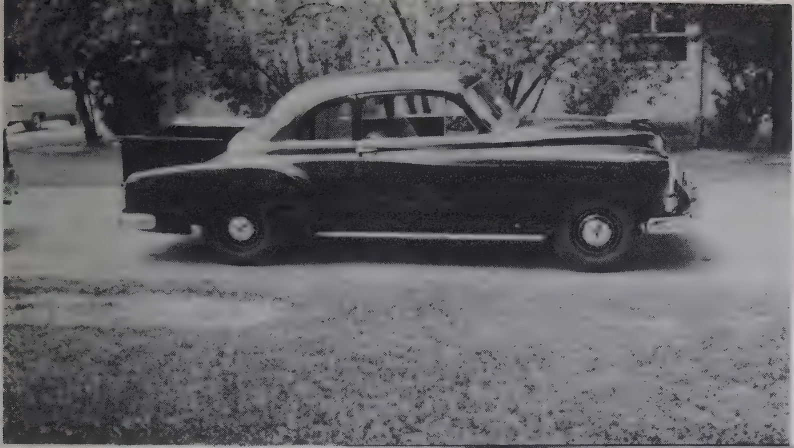
When bids were first requested on these, competition was keen and very good prices were secured; however, as general conditions changed, fewer bidders were interested because of the shortage of critical materials and small margin of profit until we no longer have any competition. Inquiries throughout the districts building their own bodies reveal a saving of 15 per cent or more in comparison to the cost of securing factory built bodies.

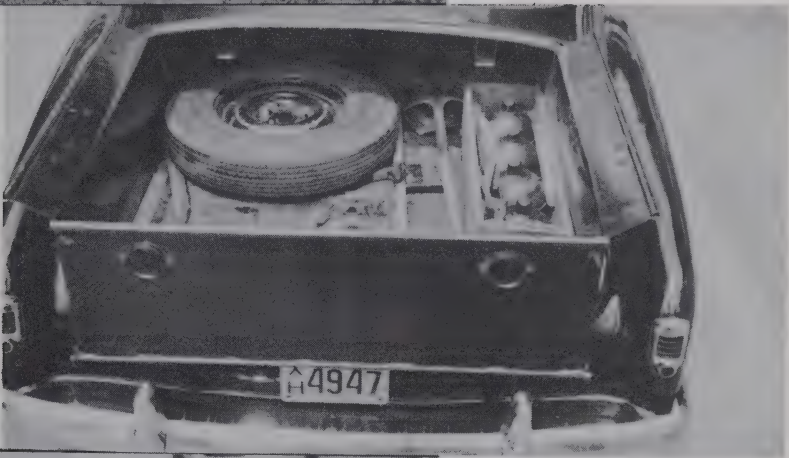
District 12 has been very cooperative in furnishing photographs and detailed sketches of the bodies that were built in their shop. Note the way in which the body is waterproofed and attached to the coupe for easy removal (see pictures) when the coupe is ready to be replaced. Also note that the body is constructed of ten gauge smooth plate throughout. The turtle back or deck lid is stored until such time as the coupe is to be sold or traded, and then it is put back on the coupe. In this way the department realizes approximately $35 to $45 more per unit.

Upon request, the Houston District will be glad to furnish any additional information desired.

Photographs of the finished job and sketches showing construction details of the coupe pickup bodies made in the Houston District Shop follow.

See following pages
for pictures and sketches . . .

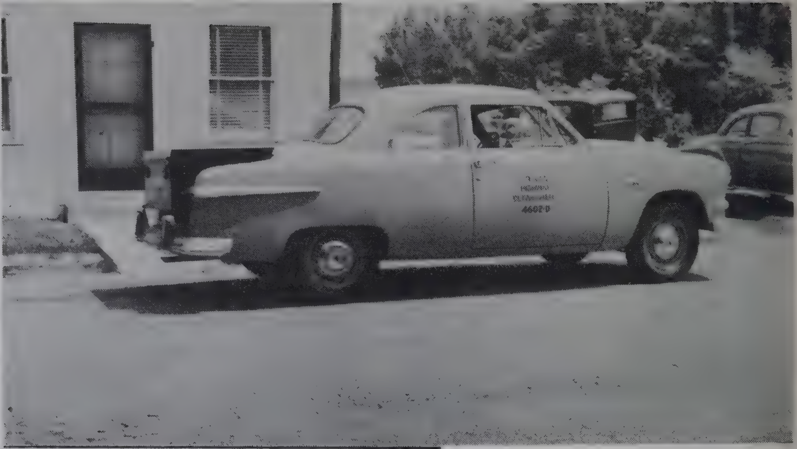


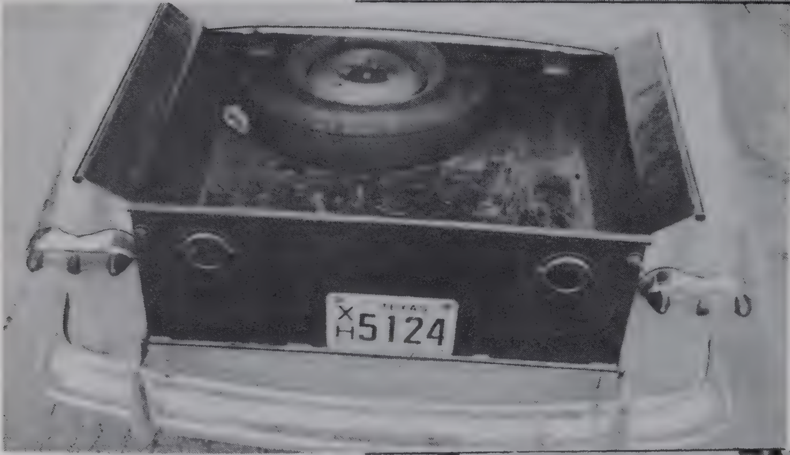


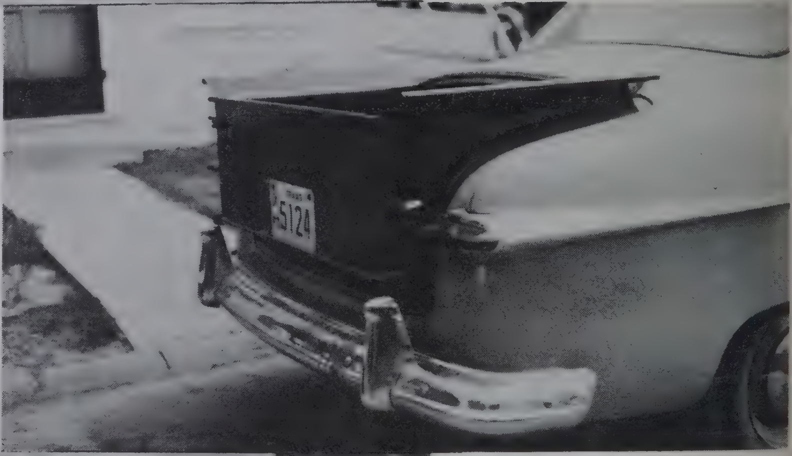
4947

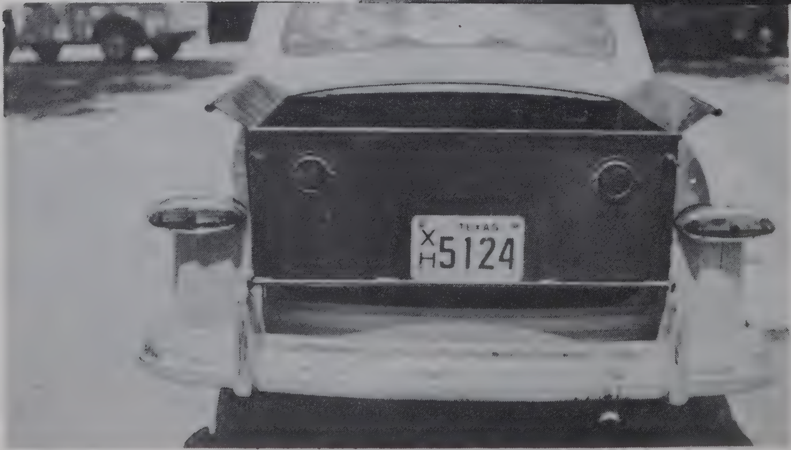
4947

4947

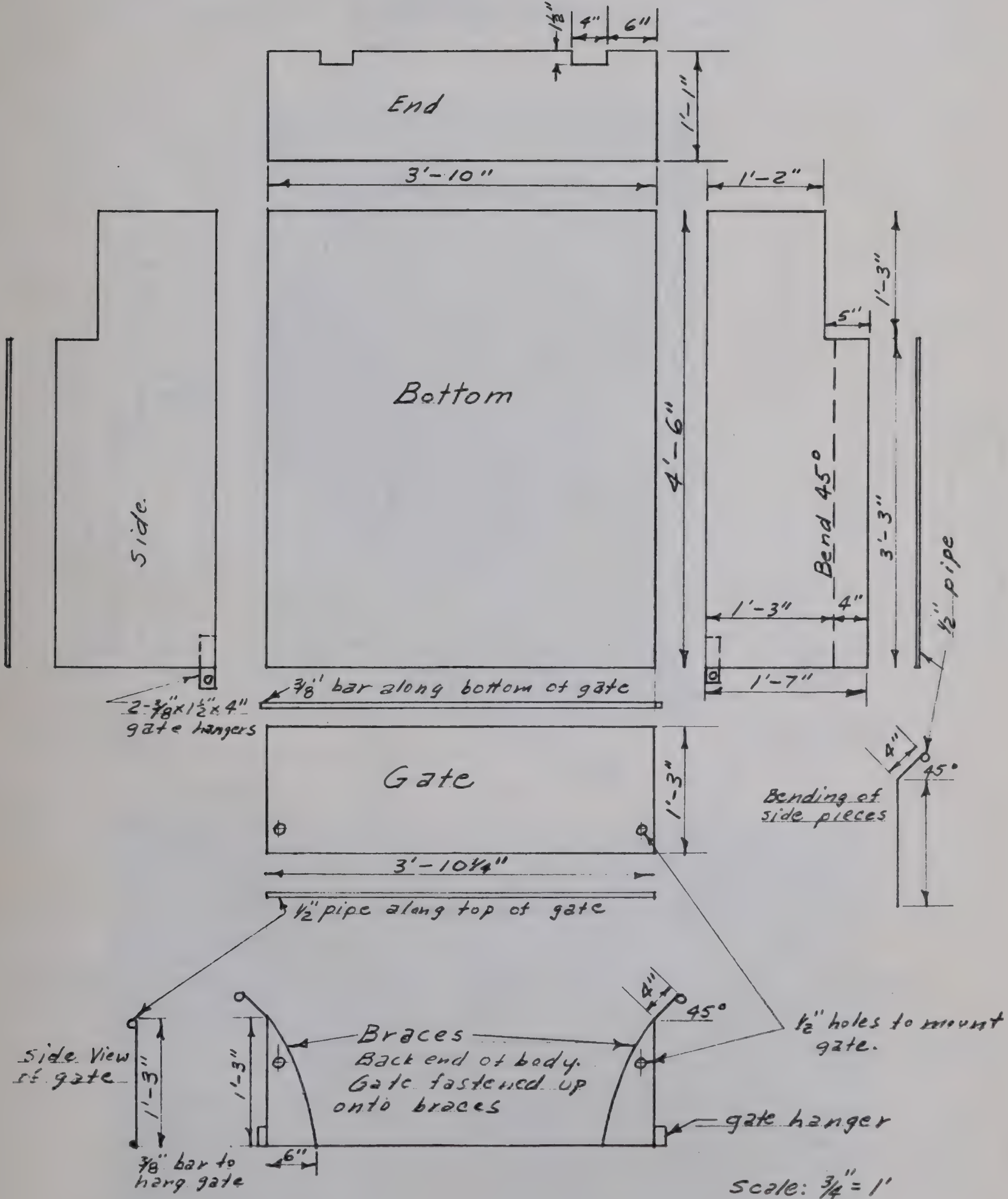

4602-D


TEXAS
XH5124

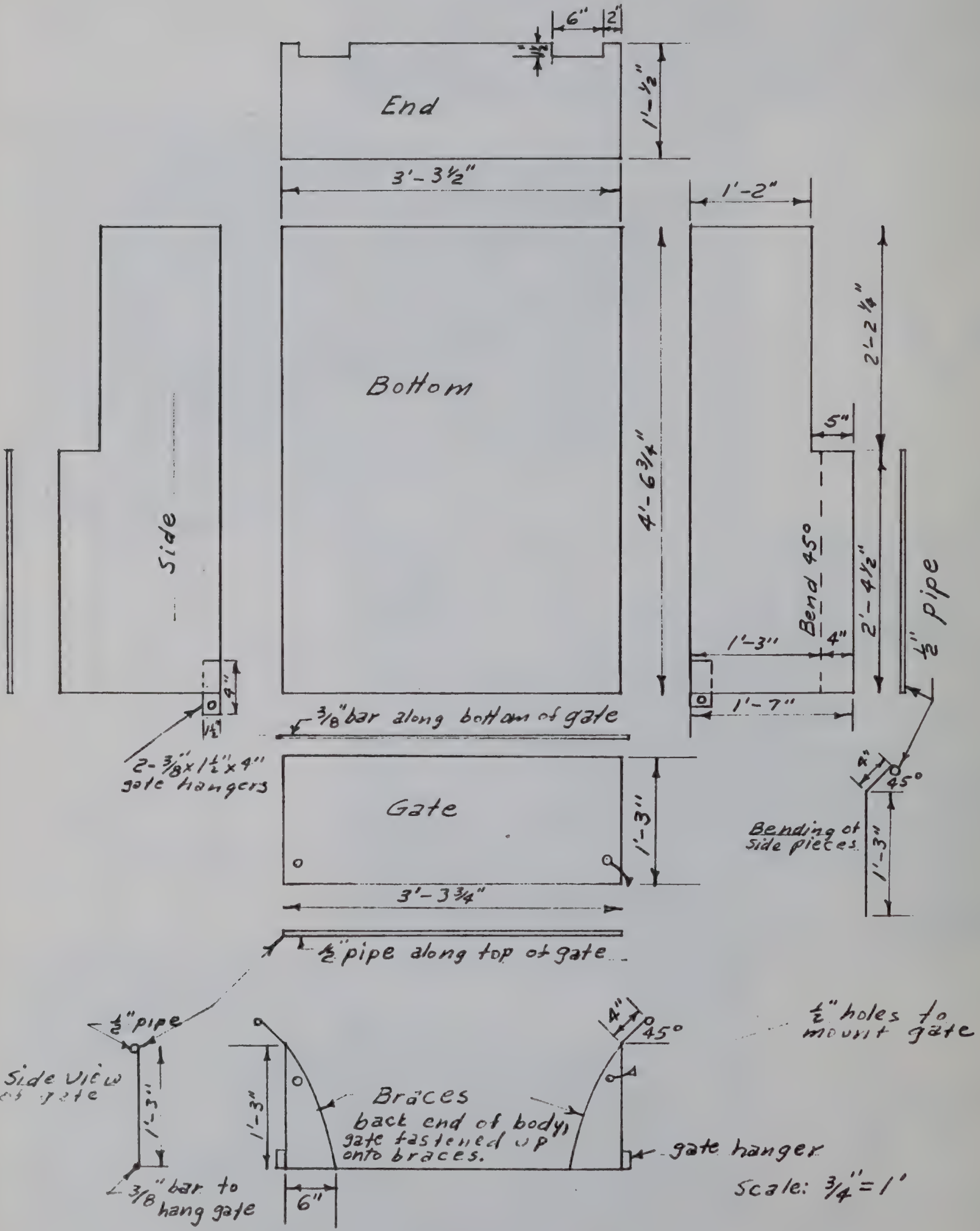

TEXAS
5124


TEXAS
XH5124

CHEVROLET PICKUP BODY
10 Gauge metal throughout
Welded Connections



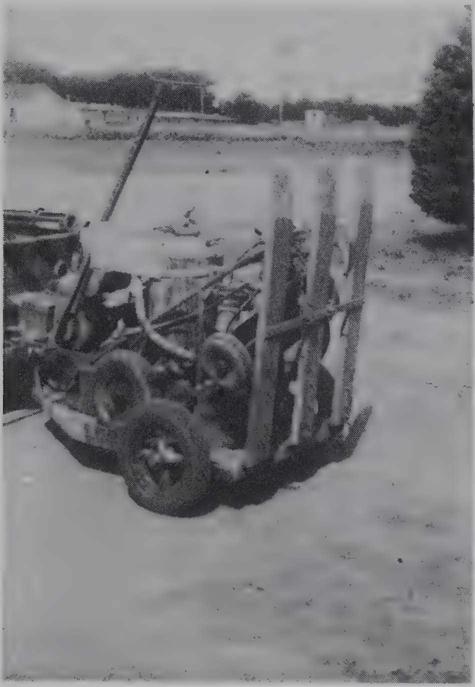
FORD PICKUP BODY
10 Gauge metal throughout
Welded Connections



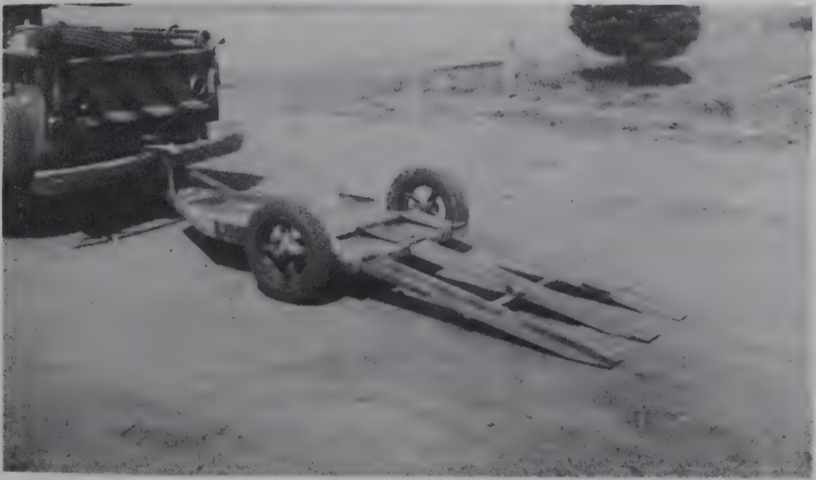
TRAILER FOR PAINT STRIPE MACHINE

Constructed and Used by Childress District

Paint stripe machine is loaded without stopping at end of stripe. Even though a move is only a few hundred feet in length, the trailer is used since it speeds up the move.



Paint stripe machine loaded on trailer.



Trailer ready for loading. Tire size 4.00 x 9.

ELEVATING GRADER ATTACHMENT FOR MOTOR GRADER

J. M. YORK
Assistant District Engineer

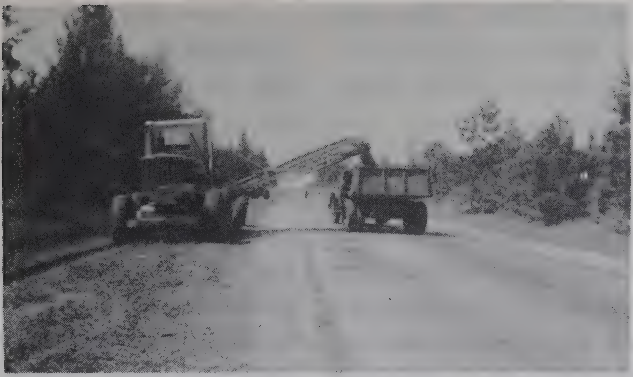
In March, 1951, a "DOMOR" elevating grader attachment for a No. 12 Caterpillar Motor Grader was purchased for use in District 11 at a cost of $5, 415. This equipment was purchased primarily for use in cleaning out ditches which have been silted up over a period of years. The usual procedure for this work in the past has been to windrow the excess material from the ditches on the shoulder with a blade and load it in trucks with an end loader. It was our opinion that the elevating grader attachment which would cast the excess dirt directly into trucks would be a more efficient operation, one advantage being that one operator handles the entire unit.

From July 2 through August 16, 1951, approximately 39 miles of shoulders, ditches and backslopes were reworked in one county. The rate at which the dirt can be moved depends somewhat on the amount of dirt to be removed from the ditch, but on the average it runs from 400 to 600 cubic yards per day.

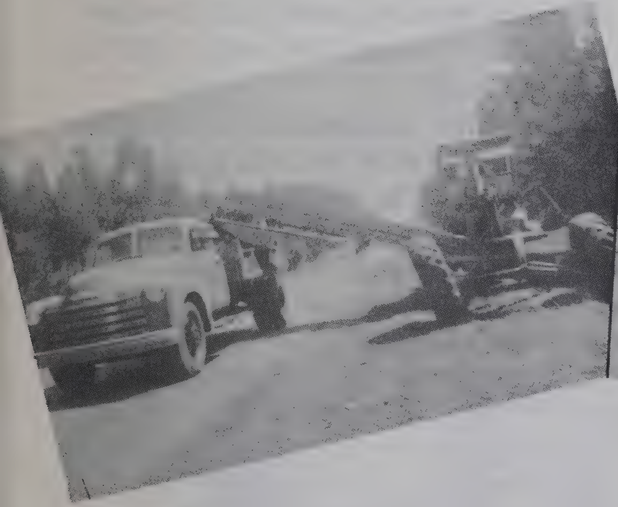
This equipment has also been used on two jobs for loading iron ore gravel. In the operation of loading iron ore gravel in one pit which was about 350 feet in length, the machine actually loaded 21 trucks of four cubic yards capacity each, or 84 cubic yards of gravel in nineteen minutes. This would be at the rate of about 265 cubic yards per hour. It is our opinion that under normal working conditions the machine will load approximately 200 cubic yards per hour in a gravel pit. On one job, the best day's run was 1200 cubic yards in nine hours and another job was 1600 cubic yards in eleven hours. This would be an average of 135 and 145 cubic yards per hour respectively. However, neither of the jobs had sufficient trucks to keep the machine in continuous operation.

The photographs, which were made by Tracy Hayes, Maintenance Foreman in San Augustine County, show the machine in operation. Number 1 shows the first cut in a ditch cleaning operation. Number 2 shows a close-up view from the front. Number 3 shows the next to the last cut. Number 4 shows the last cut with dirt being cast on the road to be bladed back on the shoulder and slope for finishing to desired section.

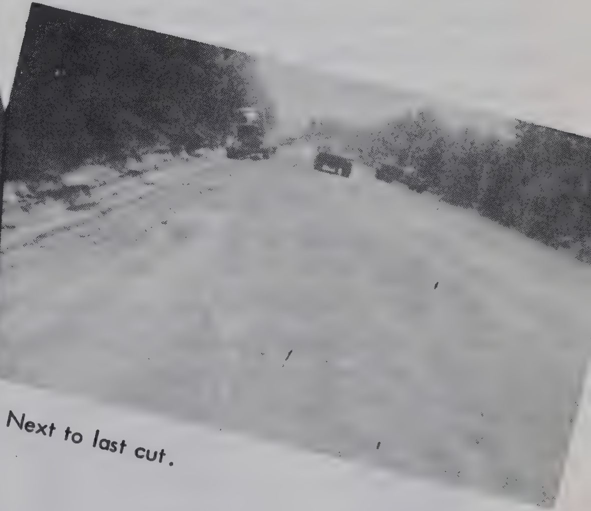
Ditches and shoulders can be



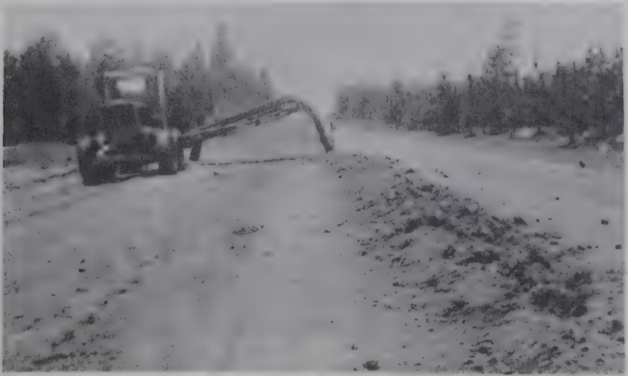
First cut in a ditch cleaning operation.



Front view.



Next to last cut.



Last cut with dirt being cast on road to be bladed back on shoulder and slope for finishing to desired section.

cut fairly close to the desired section but it is necessary to reshape the area with a blade after the dirt has been removed. We see no reason why this equipment could not be used in the construction of Farm to Market Roads along new locations by casting the dirt directly from the ditches to the road bed and then shaping the section with a blade, although we have not actually used it to date for this purpose.

We believe this equipment would be ideal for loading dirt from a borrow source provided the material contains some moisture because we have noticed that extremely dry material is not handled as well by the elevator as material containing moisture. The equipment could also be used for loading sod.

This elevating grader attachment has not been removed since the original installation; therefore, we are not in a position to furnish accurate information as to the time required to make the change-over from blade to elevating grader and vice-versa. More time was used in the first installation of the attachment than should have been required because of lack of previous experience. It is the opinion of the men who made the initial installation that the change-over can be made by three men and a winch truck or crane in less than a day's time.

It is the consensus of opinion in this District that this piece of equipment can be used advantageously on the various types of work mentioned.

TWENTY-FIVE AND THIRTY YEAR AWARDS . . .

Front row: Mariese Ferguson, Ramon Lira, N. D. Redfearn, A. D. Richardson, Junius F. Richardson, H. G. Roberson, and Joe A. Russell.

Middle row: Douglas Burk, B. G. Capps, D. L. Carman, Bernie L. Dodd, J. Frank Doggett, A. D. Drake, and William V. Favor.

Back row: L. D. Cabaniss, J. D. Dickey, Holland Eggleston, Bert Hedick, W. G. Kinney, H. P. Krause, and Arthur Ash.

* S. J. Treadaway, Retiring District Engineer, and M.M. Miller, Skilled Laborer, were not present.

Visitors . . .

EQUIPMENT AND PROCUREMENT DIVISION

during the past month we have had two distinguished visitors from foreign countries, both of whom are connected with their respective departments as Equipment Engineers.

Huseyin (Mike) Celenk is Chief Equipment Engineer, District 8, in Elazig, Turkey, and has held that position since 1948. We understand this is a responsible position, especially for a young man of twenty-six years of age.

He landed in New York City, January 11, and reported to the Bureau of Public Roads in Washington D.C., which sponsored his trip to Texas. Arriving in Austin on May 7, he went to Laredo and spent some time with H. B. Zachary Construction Company, learning the use of equipment on construction work.

Upon his return to Austin, Mr. Celenk was taken to District 8 in Abilene. This, incidentally, is where he acquired the name of "Mike." When Mr. Celenk was introduced to the District Engineer, Jake Roberts, Jake immediately informed him that the name Huseyin to him meant simply "Mike," and the name has stuck with him throughout his stay in the Department.

Mr. Celenk again reported to the Austin Office, and has been in the Equipment and Procurement Division since August 1. He is interested in the procedure of purchasing equipment as well as its use. He informs us that he has visited several manufacturers and has spent some time in the shops of some of the larger producers of highway equipment. He believes that there is not too much difference in the equipment they use and that used by the Department, because all of the equipment is manufactured in the United States.

It is always a pleasure to be of assistance to any of the visitors from foreign countries, and especially Mike, since he is quick to learn, and has learned to speak English very well in the short time that he has spent in this country.

We have also had the pleasure of working with Mr. C. Mario Lopez, who is Assistant Service Engineer of the Highway Department at Montevideo, Uruguay. He states that his duties consist of purchasing and maintaining all equipment used by his Department.

Mr. Lopez attended the School of Engineering and graduated as an Industrial Engineer in Montevideo, Uruguay. His country, he says, is about as large as the state of Illinois, and maintains 4000 miles of road, of which 1000 miles are "hard top" and 3000 are gravel.

Sponsored and brought to this

country by the United States Department of Labor in connection with the Government of Uruguay, Mr. Lopez spent four months at the Caterpillar Factory and three months at Ford Motor Company. He also spent three weeks with the Illinois Highway Department. He spent several weeks in this office, and we were very happy to show him the procedure used by the Texas Highway Department in securing equipment and materials.

We understand that he has been in this country about ten months and is now en route to Washington and will return to Uruguay in the very near future.

Left to right:
James E. Drake and Huseyin Celenk

Left to right:
C. Mario Lopez and J.L. Heim Jr.

WILSON ELECTRICAL EQUIPMENT COMPANY
2930 Commerce Street - HOUSTON 3, TEXAS - AT-1557

June 26, 1951

Texas Highway Department
Austin, Texas

Gentlemen:

Driving to Garrison from Houston last Friday, I encountered a stretch of new construction. As I entered this area I was given a very pleasantly worded note of explanation and warning, and I want to compliment you for this method of handling a frequently unpleasant problem.

All to seldom does your department receive the credit which is due it for the excellent job of "customer relations" which you have performed in the way of roadside parks, highway beautification, etc. I have had a number of visitors from other states riding with me the last few months and they have been unanimous in the compliments of the Texas Highway system, particularly when the tremendous distance and mileage involved are taken into consideration.

One word of comment, however, is that several of the hills on a comparatively new stretch of road both sides of (U.S.) are lacking the no-pass stripe that is of such great assistance to the careful driver.

Again congratulating you on the good job that you are doing, I am

Sincerely yours,

W. F. Wilson

WFW/mac

"THE OLD"

1929

Official Highway Travel Map

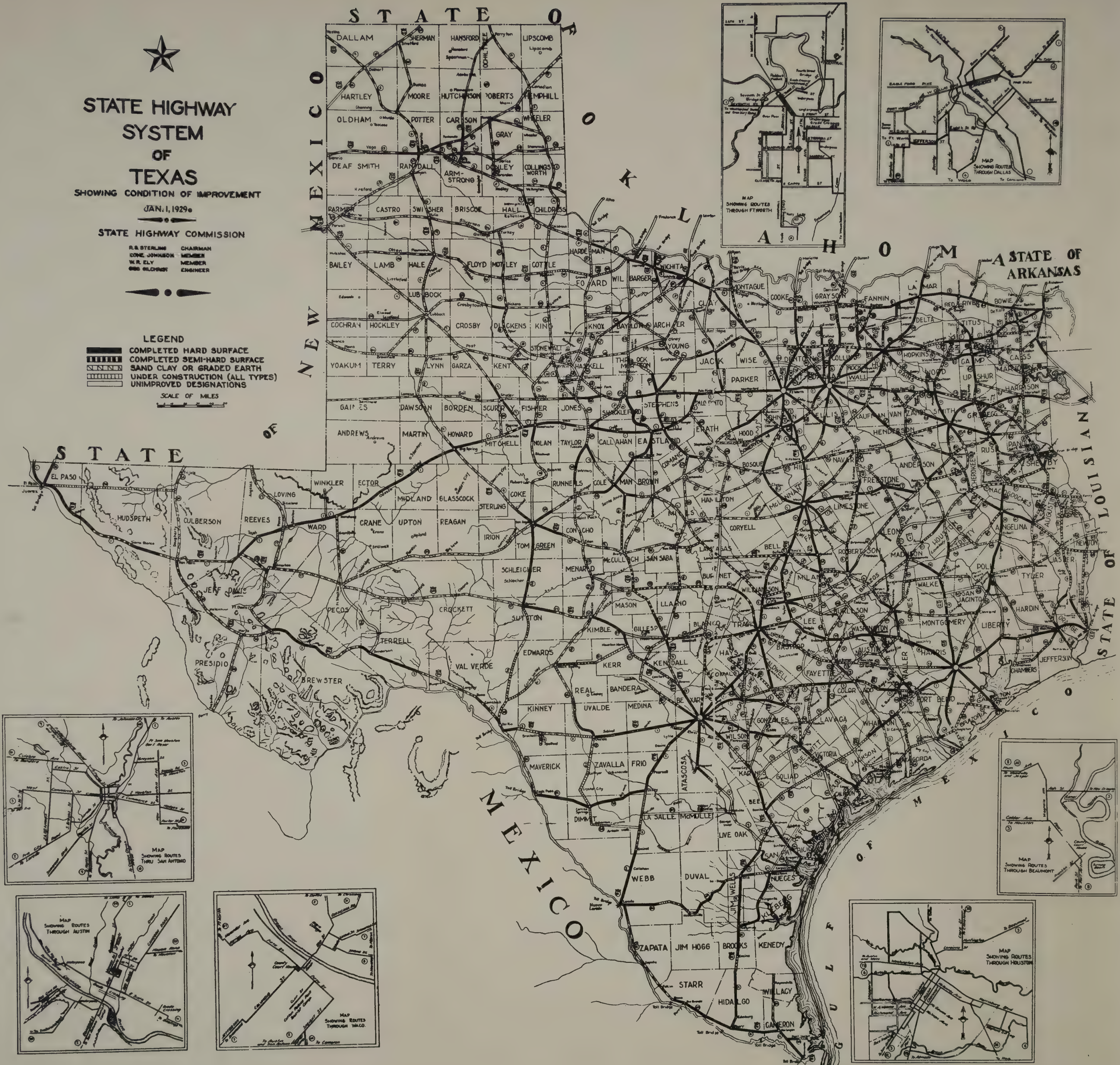
BY WAY O

In 1929 o
6000 miles
state mainte
approximate
our 39014 mi
are paved.

In 1929 the
registered i
3,400,000 re
the current y

"THE NEW" 1951

Official Highway Travel Map



STATE HIGHWAY SYSTEM OF TEXAS

SHOWING CONDITION OF IMPROVEMENT

JAN. 1, 1929

STATE HIGHWAY COMMISSION

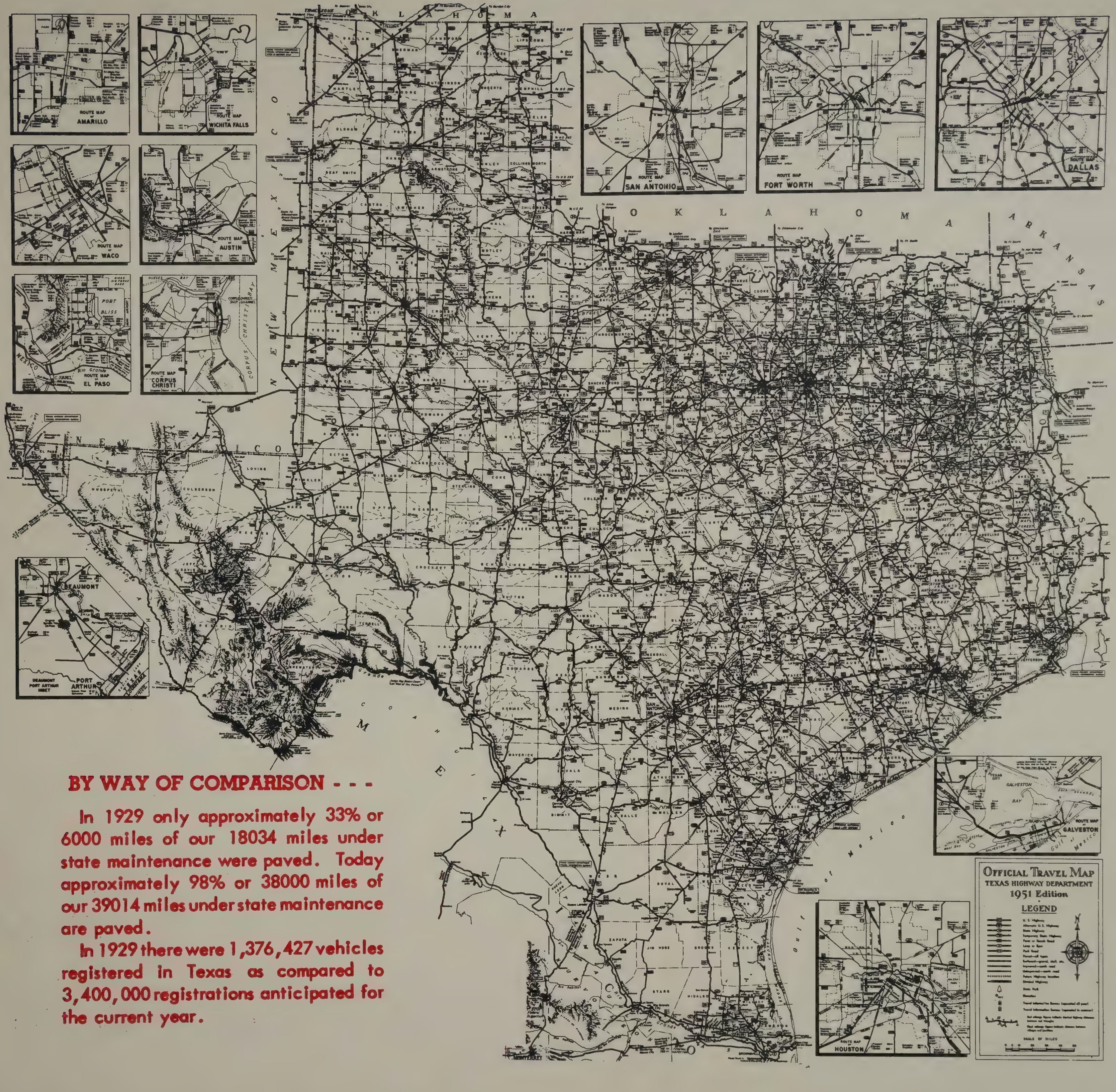
R.S. STERLING CHAIRMAN
CONE JOHNSON MEMBER
W.R. ELY MEMBER
GIBB GILCHRIST ENGINEER

LEGEND

- ▬ COMPLETED HARD SURFACE
- ▮▮▮ COMPLETED SEMI-HARD SURFACE
- ▨ SAND CLAY OR GRADED EARTH
- ▯▯▯ UNDER CONSTRUCTION (ALL TYPES)
- ▭ UNIMPROVED DESIGNATIONS

SCALE OF MILES

STATE OF NEW MEXICO
STATE OF OKLAHOMA
STATE OF ARKANSAS
STATE OF LOUISIANA
MEXICO
GULF OF MEXICO
MAP SHOWING ROUTES THROUGH FT. WORTH
MAP SHOWING ROUTES THROUGH DALLAS
MAP SHOWING ROUTES THRU SAN ANTONIO
MAP SHOWING ROUTES THROUGH AUSTIN
MAP SHOWING ROUTES THROUGH WACO
MAP SHOWING ROUTES THROUGH BEAUMONT
MAP SHOWING ROUTES THROUGH HOUSTON
EL PASO
Toll Bridge



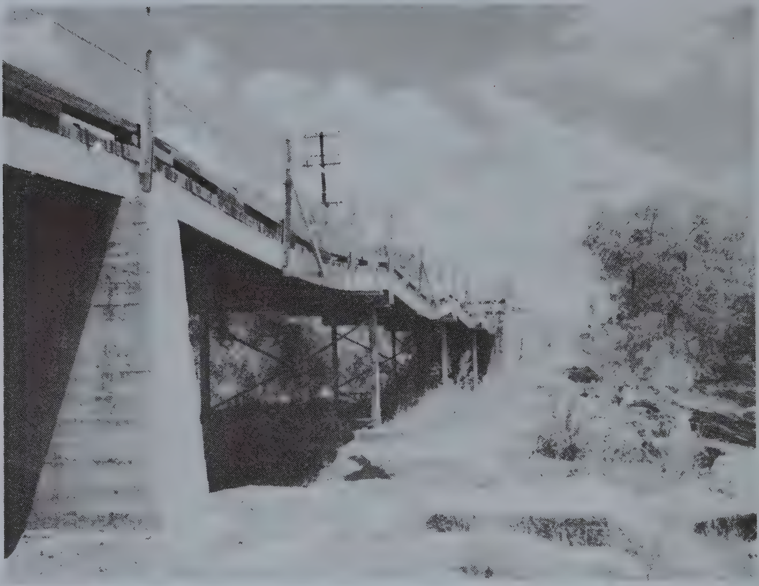
BY WAY OF COMPARISON - - -

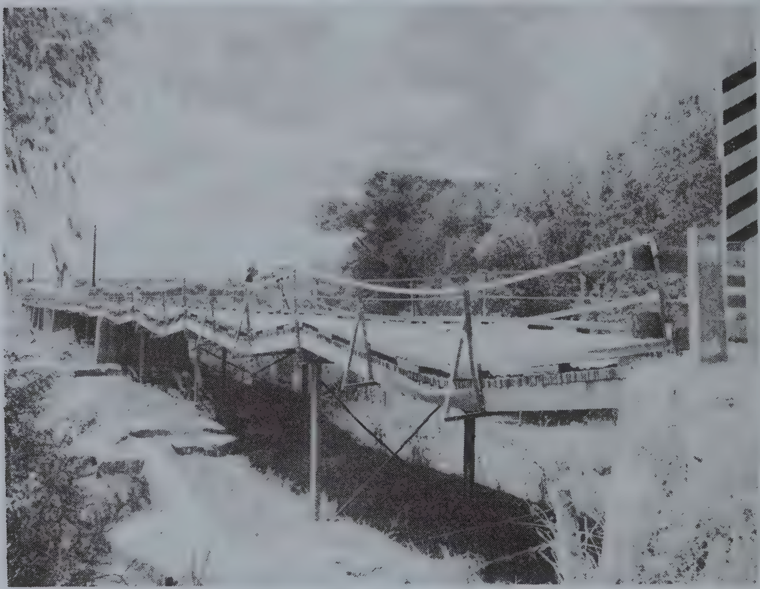
In 1929 only approximately 33% or 6000 miles of our 18034 miles under state maintenance were paved. Today approximately 98% or 38000 miles of our 39014 miles under state maintenance are paved.

In 1929 there were 1,376,427 vehicles registered in Texas as compared to 3,400,000 registrations anticipated for the current year.

ESPANTOSA LAKE BRIDGE

FM 395, Zavala County





The above pictures were taken of the structure over Espantosa Lake which was badly damaged by an overloaded truck about ten days ago.

The first picture was taken looking in an easterly direction, which is the direction the truck was going. The other picture was taken looking west. The truck entered the structure at the west end, and you will note from the pictures that as it proceeded over the structure the damage became appreciably worse.

We are starting the removal of this structure sometime this week and after completion of this item of work we will start the construction of the multiple box culvert to replace the structure, for which funds have been provided.

M. B. HODGES, *District Engineer*

Reconditioning the Floor System

Brazos River Bridge

CLAUDE RINEY
Senior Resident Engineer

The contract for reconditioning the floor system on the Brazos River Bridge was awarded to Foust Construction Company in October, 1950. Work began in November under the direction of Mr. Dan Beason, Superintendent for Foust Construction Company, and the writer, as Resident Engineer for the Highway Department.

The existing bridge consisted of two 200 foot through railway trusses across the main channel. The north approach consisted of three pile timber bents on 15 foot centers, with 4" x 12" timber stringers, and the south approach had similar timber bents plus a 100 foot pony truss. The floor was timber for the full length of structure.

Construction plans provided for removal of timber floor and re-spacing of timber stringers as shown in Figure 1 and the use of 8 inch I-beams salvaged from the old pony truss welded and spaced as shown in Figure 2. The old 100 foot pony truss was replaced with two 100 foot expanded I-beams. A new floor of reinforced concrete was provided throughout. (A later article will discuss these expanded I-beams.)

Because of the close spacing of the timber stringers and 8 inch I-beams, it was thought as plans were being prepared, that conventional timber forming might be too costly. A note was included in the plans allowing contractors to use 28 gauge metal for forming the bottom of the slab, this metal to remain in place. On the first slab formed and poured, timber forming was used. On the next, the contractor elected to use the 28 gauge metal. Both of these methods were extremely costly, and restrictions on metal made it almost impossible to secure enough 28 gauge material to complete the job. At this point in the progress of construction someone suggested using Steeltex for the bottom form. The contractor secured a roll to try and found it to be more economical than the other methods, and also satisfactory for the purpose.

We find only two objections to the use of Steeltex, the first is danger of tearing holes in the paper, and the second, a slight amount of sagging between stringers. The first can be eliminated almost entirely by placing sufficient board walkways for the workmen and insisting they stay on the boards. The sagging of the material resulted in an overrun of concrete which was absorbed by the contractor.

Steeltex material resembles a heavy tar paper, interwoven with small cording and a wire mesh similar in appearance to chicken fence wire. It is fastened to timber stringers by nailing with standard fence staples across the wire reinforcing, Figure 3, and on steel I-beam stringers by use of special wire hooks which engage the mesh reinforcement and also clamp under the beam flanges, Figure 4.

On this project, the maximum stringer spacing was 26 inches center to center, however, the actual unsupported span was only 20 inches. With the 20 inch span the paper sagged between one-half and one inch under a load of an average six and one-eighth inch concrete slab. Stretchers are available for use in pulling Steeltex tight when applying material to stringers, and if they are used, sag could be reduced considerably. They were not used on this project.

In the following tables are comparative costs of the three methods of forming the bottom slab on this project, estimate of cost being furnished by the contractor.

In making these comparisons it was assumed that 40 per cent of form lumber could be salvaged for other work or for future spans, however, enough lumber must be on hand at all times to form far enough ahead to allow the previous placements to receive the proper amount of curing. Wastage and damage to lumber forms on such close spans is large. Amount for loss in concrete due to sag in Steeltex was estimated on the basis of loss of materials only.

Probably the greatest economy evidenced in the use of Steeltex is in time saved. The greatest saving would probably be on the steel I-beam spans. Since enough lumber would be required to form the entire unit to avoid delays for necessary curing before wrecking and re-using the forms.

The use of Steeltex is economical and satisfactory for reconditioning jobs such as the one described herein, where small timber or steel stringers are placed on close centers. It could also prove successful on new construction where short form spans are the rule. Since sixteen inches is the usual joist spacing for support of decking, Steeltex could be substituted in many cases for the usual one inch lumber decking.

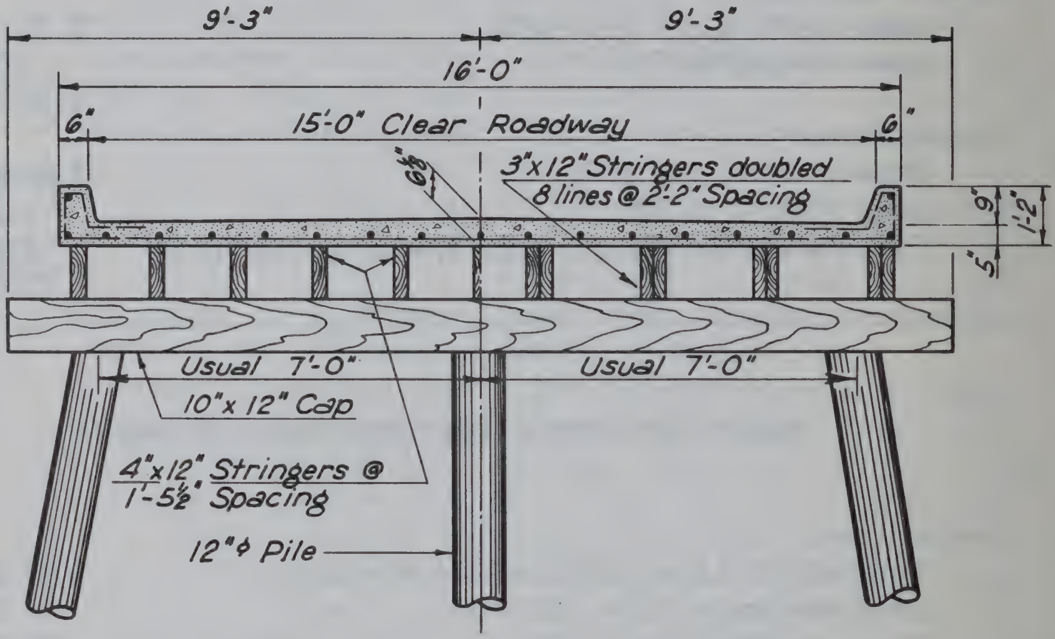
Steeltex is manufactured by Pittsburgh Steel Products Company. The particular type suitable for this form use is Steeltex Floor Lath.

FIFTEEN BY SIXTEEN FEET TIMBER STRINGER SPANS

Lumber Forms	
Material 480 f.b.m. @ 13¢ = $62.40 x 60%	$ 37.44
Labor installation 16 hrs. @ $1.25	20.00
Labor wrecking 3 hrs. @ $1.25	3.75
	$ 61.19
Sheet Metal Forms	
Material 240 sq. ft. @ 13 1/2¢	$ 32.40
Labor 3 hrs. @ $1.25	3.75
	$ 36.15
Steeltex Forms	
Material 240 sq. ft. @ 7¢	$ 16.80
Labor 2 hrs. @ $1.25	2.50
Concrete loss due to sag in paper 1/4 cu. yd. @ $12.00	3.00
	$ 21.30

THIRTY BY SIXTEEN FEET STEEL I-BEAM SPANS

Lumber Forms	
Materials 960 f.b.m. @ 13¢ = $124.80 x 60%	$ 74.88
Labor installation 25 hrs. @ $1.25	31.25
Labor wrecking 12 hrs. @ $1.25	15.00
	$121.13
Sheet Metal Forms	
Material 480 sq. ft. @ 13 1/2¢	$ 64.80
Labor 6 hrs. @ $1.25	7.50
	$ 72.30
Steeltex Forms	
Materials 480 sq. ft. @ 7¢	$ 33.60
Labor 9 hrs. @ $1.25	11.25
Concrete loss due to sag in paper 1/2 cu. yd. @ $12.00	6.00
	$ 50.85

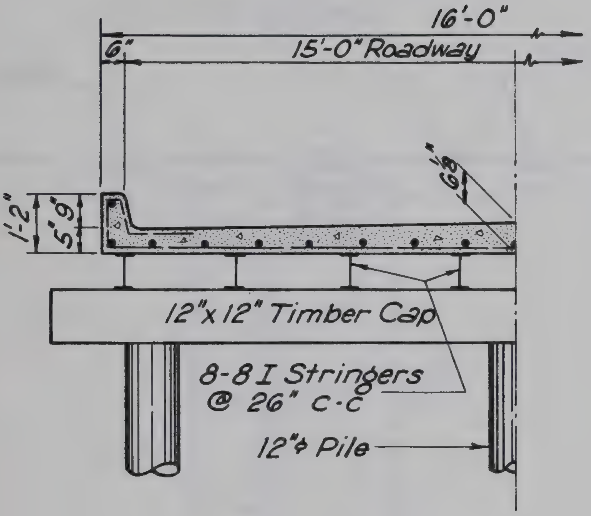


HALF SECTION
North Approach

HALF SECTION
South Approach

TIMBER STRINGER SPANS

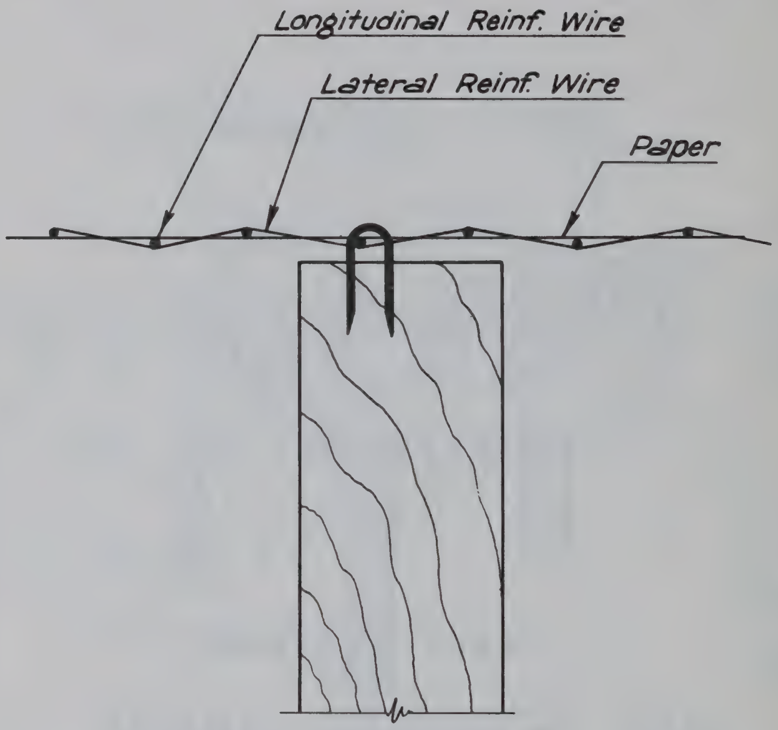
FIGURE 1



HALF SECTION

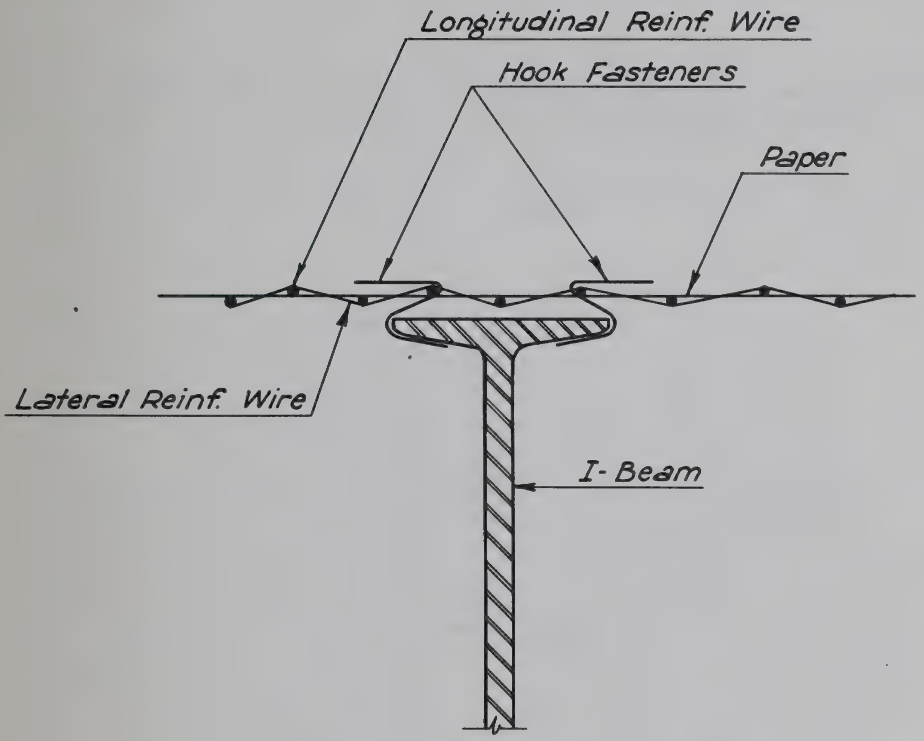
8" I STRINGER SPANS

FIGURE 2



DETAIL OF STEELTEX
ON TIMBER STRINGER

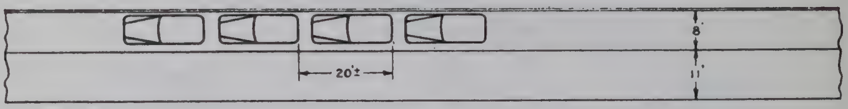
FIGURE 3



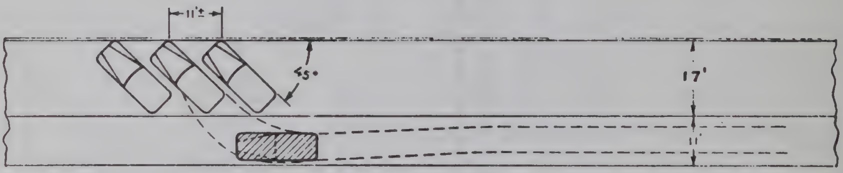
DETAIL OF STEELTEX
ON I-BEAMS

FIGURE 4

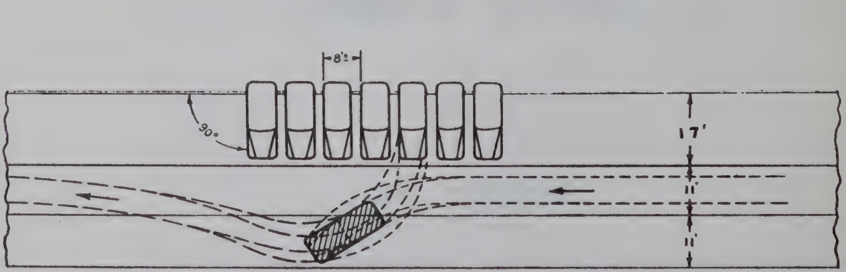
COMPARATIVE STREET SPACE REQUIRED FOR DIFFERENT TYPES OF PARKING



PARALLEL



45° ANGLE



90° ANGLE

Texas Highway Department
Form 433-B 1-51-40m

S866-151-40m

INTEROFFICE MEMORANDUM

TO: Mr. D. C. Greer

FROM: Fred T. Bennett

SUBJECT: Request for Continuance of Angle Parking on U. S. . . . in . . . after Completion of Proposed Widening Project

Date May 16, 1951

Responsible

Desk D-16

You directed this office to review the files and furnish you with a discussion and recommendations on the request of a group of . . . merchants who appeared before the Highway Commission to request that angle parking be permitted on U. S. . . . in . . . after it is widened.

We have reviewed the files, and we recommend that the request for continuance of angle parking not be granted for the following reasons:

1. The depth of the existing curb cutbacks is not adequate to compensate for the extra street width required for dead storage of vehicles parked at a 45-degree angle compared with that of parallel parking. There are sketches in this file showing existing cutbacks at . . . and . . . eight feet deep, at . . . and . . . six feet deep, and at . . . and . . . six feet deep. Dead storage space required for a passenger vehicle parked at a 45-degree angle to the curb is seventeen feet compared with eight feet required for parallel parking. The eight-foot cutback is one foot shy, and the six-foot cutbacks are three feet shy. The deficiency in depth of the cutbacks would be even greater for trucks which would no doubt use them for delivery of merchandise.

2. Even though cutbacks were increased in depth to compensate for the existing deficiency in street width required for dead storage of vehicles, angle parking would still have the over-all effect of reducing the efficiency of the roadway in moving traffic due to the tendency of some motorists to back excessive distances into the street and thereby block an additional lane. Many motorists do not seem to realize the minimum needs for clearing vehicles in front of theirs and unduly delay moving traffic by backing several car lengths more than is necessary to complete the unparking maneuver.

3. Angle parking is generally conceded to be more hazardous than parallel parking. This is due to lack of visibility in leaving the parking stall and the opportunity an angle parking stall affords a motorist to back into the street quickly. We

INTEROFFICE MEMORANDUM

TO:

FROM:

SUBJECT:

Date

Responsible

Desk

have made no comparative accident studies of angle versus parallel parking, but the results of a study conducted by the City of Salem, Oregon, over a period of five years show that accidents attributable to parking were reduced 65 per cent by changing from angle to parallel parking. A similar study conducted by the Chicago Surface Lines which covered a period of one year showed a reduction of 71 per cent when angle parking was changed to parallel parking on a two-block length of street.

4. The change from angle to parallel parking would not inconvenience the customers of the business firms in question too much except possibly some motorists that have difficulty with parallel parking. This can hardly be called a legitimate complaint since a motorist must be able to park parallel to the curb in order to pass a driver's license test.

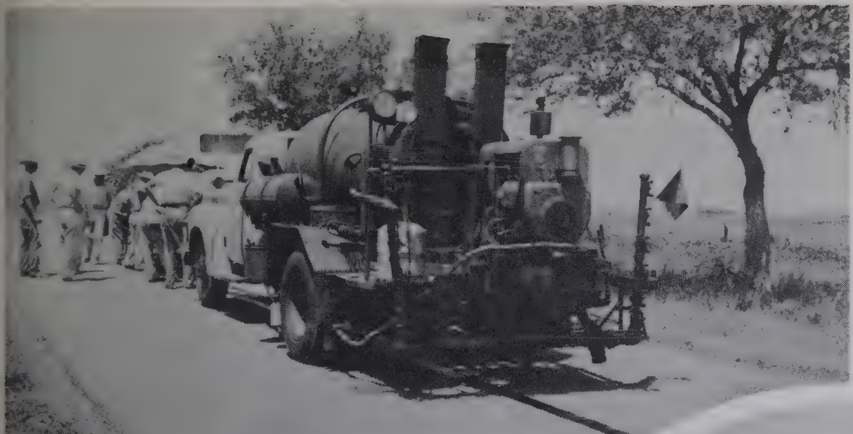
One of the sketches referred to in paragraph 1 shows the curb cutback to be 6' x 85'. This provides eight spaces for 45-degree angle parking. If changed to parallel parking, the number of spaces would be reduced to four. Since a 350-foot block length will provide at least thirteen parallel parking spaces at the curb, there will be enough additional spaces in the same block to compensate for the four angle parking spaces that are eliminated with very little walking distance added.

5. If angle parking is permitted to continue in the existing curb cutbacks, it will be exceedingly difficult to justify a refusal to grant future requests for curb cutbacks for business establishments that might be built along . . .

6. It is a well known fact that . . . carries one of the heaviest traffic volumes of any highway in the state, and this hardly seems like the right place to make an exception of the parallel parking requirement that is generally included in construction agreements in other cities of the state.

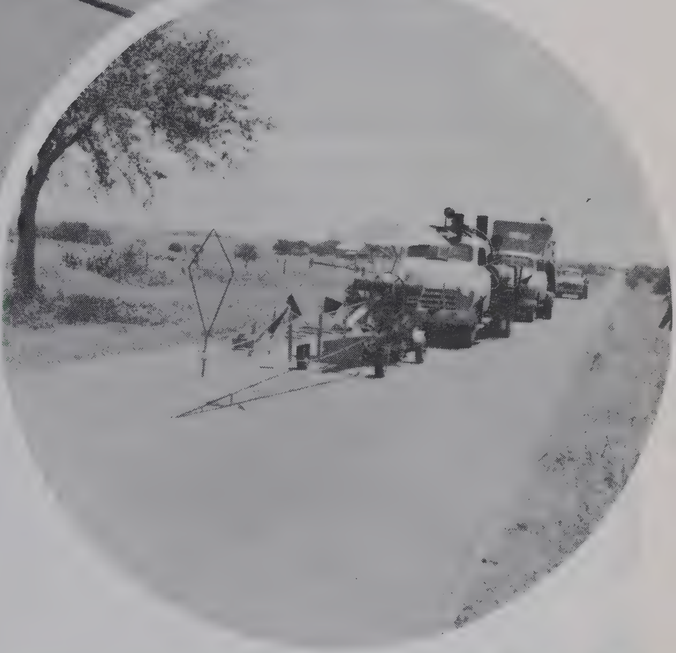
7. It is a rather time worn but true expression that the primary purpose of a street or highway is to move traffic and that the parking of vehicles at the curb should not be permitted to impair the ability of a street to serve that purpose.

MVG:wm



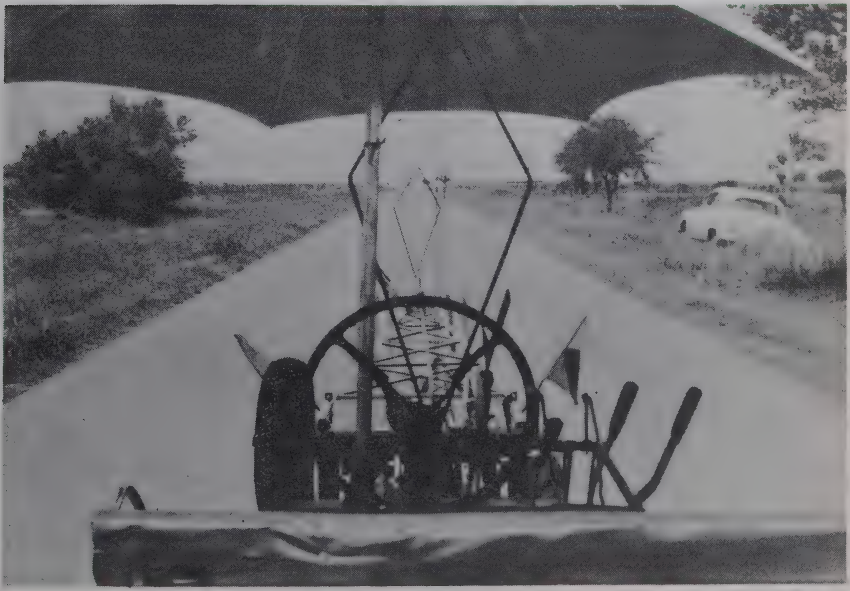
Asphalt distributor used to push center stripe machine and to supply asphalt to it.

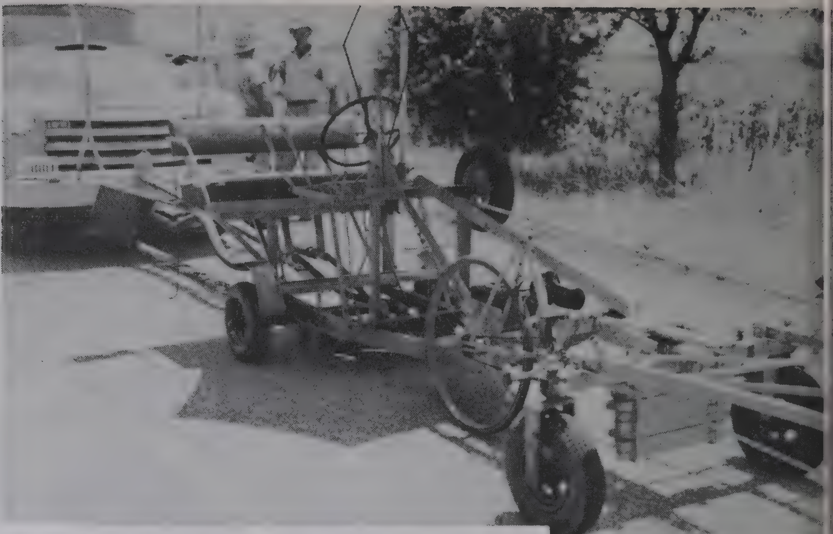
Center Striping District 13



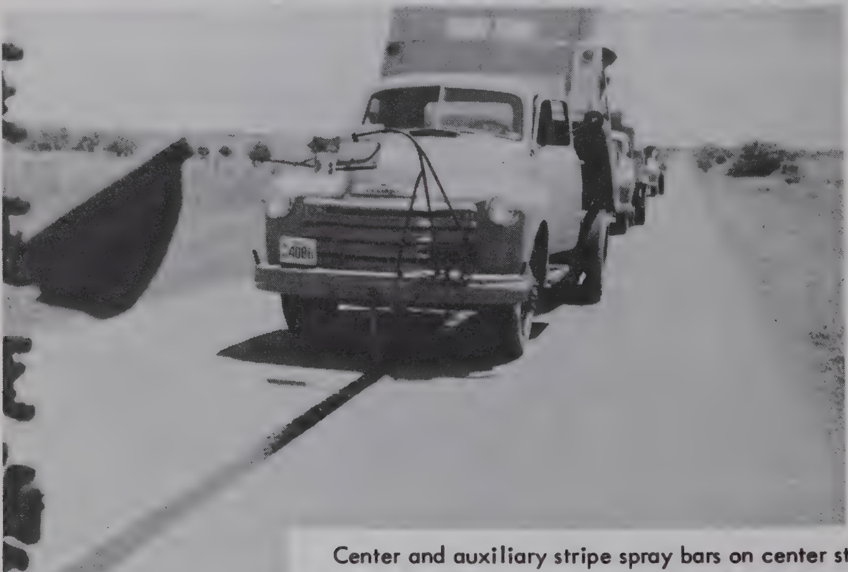
Asphalt center-striping machine and rock distributing machine placing asphalt and rock center stripe on U.S. 77, Lavaca County.

ights on the center stripe ma-
hine. In placing stripe, sights
re lined up with red-flagged
oints in center of road.



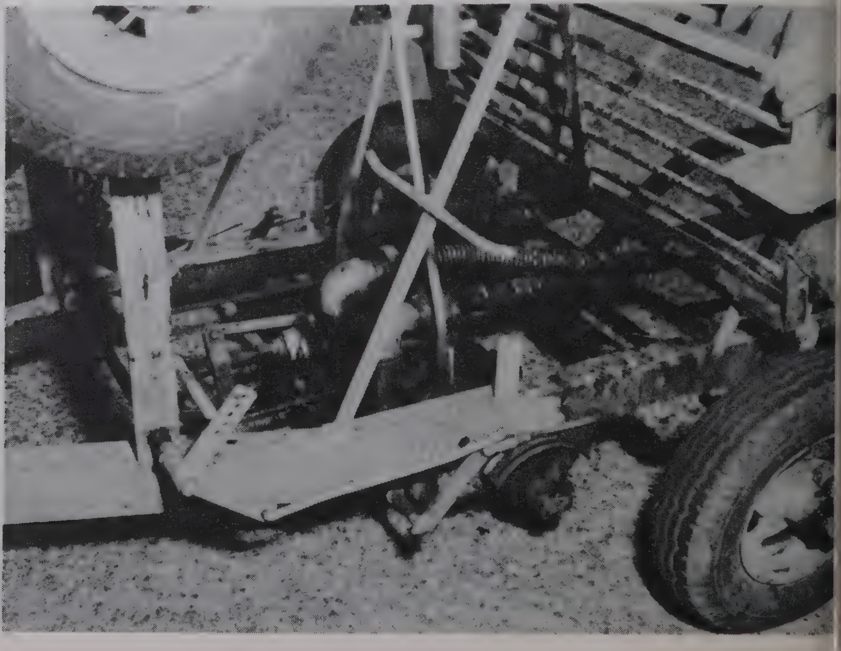


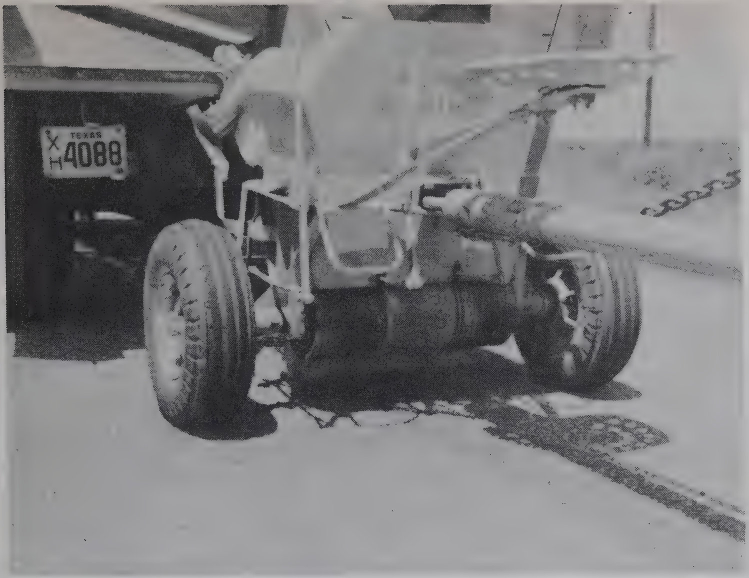
Asphalt center stripe machine showing connection with asphalt distributor.



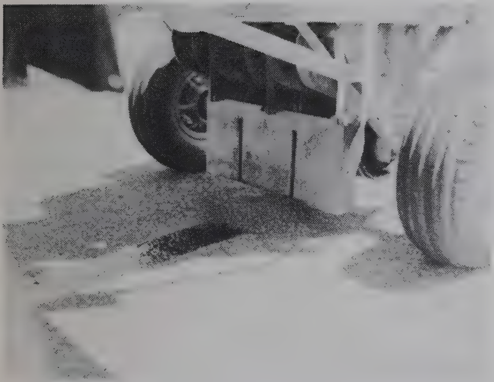
Stone distributing truck showing location of mirror used by driver to keep spreader box on center stripe.

Center and auxiliary stripe spray bars on center stripe machine.





Stone spreader box showing chute for center and auxiliary stripe.

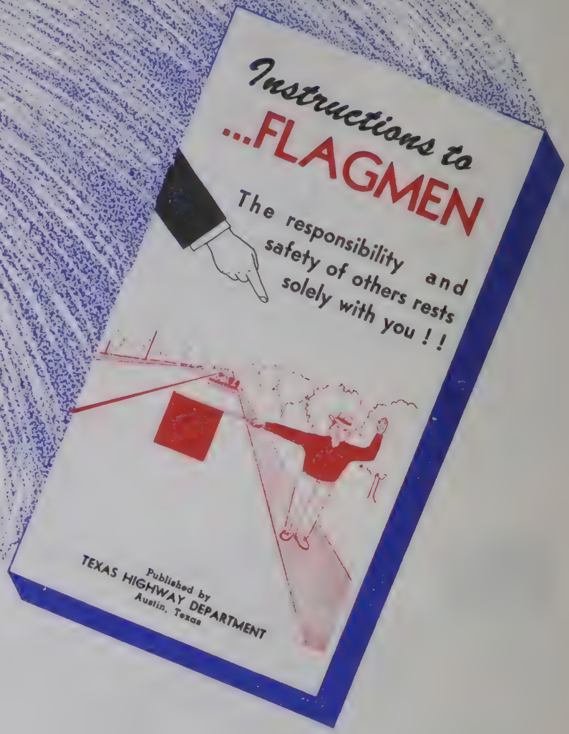


Stone spreader box.

Stone spreader box and roller.

Machines in operation.

Flagging Procedure . . .



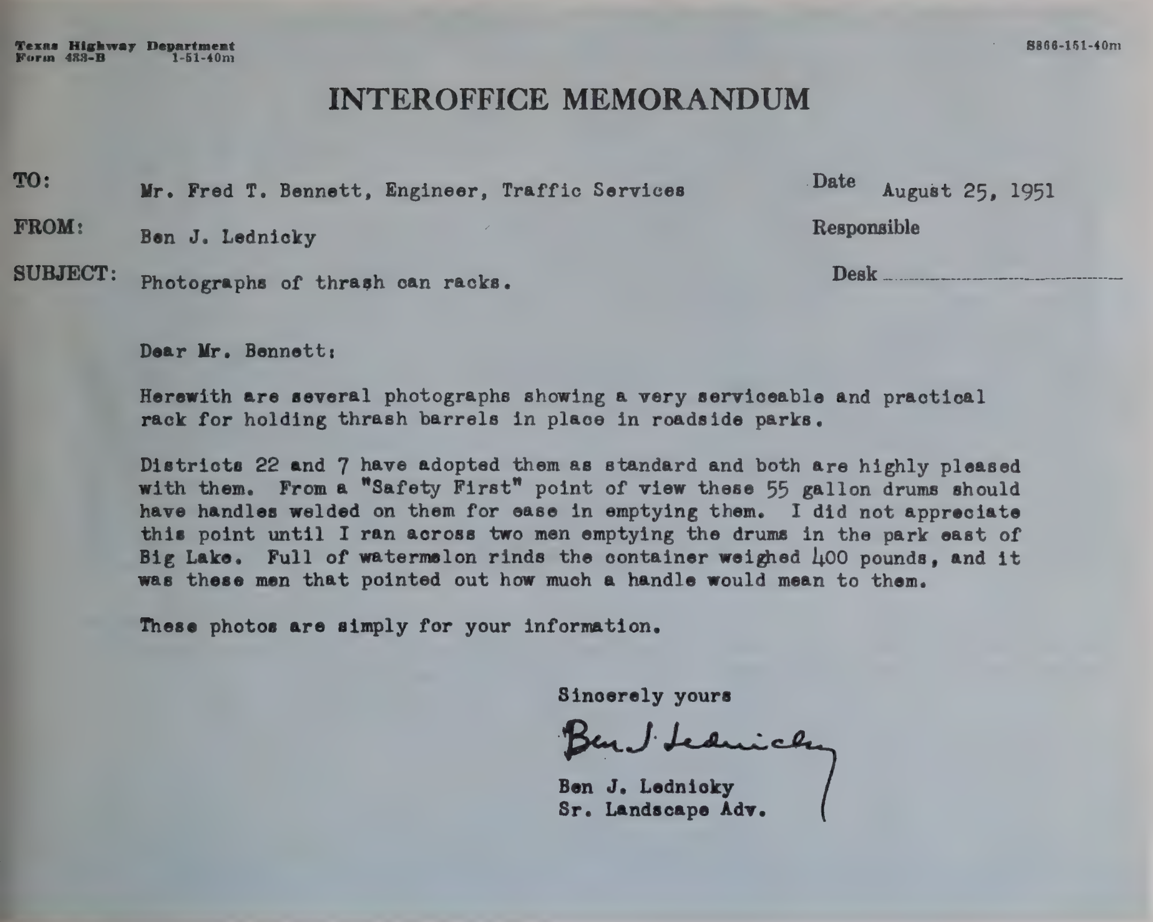
J. A. WALLER, Chief Engineer
Construction and Maintenance

In an effort to unify flagging procedure and encourage the use of standard equipment along with uniform instructions, a pamphlet on this subject has been prepared. These pamphlets illustrate some of the more common mistakes made by flagmen and outline the basic rules and instructions which should be followed when flagging and directing traffic.

It is hoped that each District will give an adequate distribution of these pamphlets and stress to the respective flagmen, the important role they play from the standpoint of safety and public relations. The public will invariably have a greater tendency to judge the construction job from the impression of and treatment received from the flagmen, than the actual work being performed.

Flagmen are not only responsible for their fellow workers' safety but also the responsibility of directing traffic safely through construction areas rest solely upon their shoulders. They are in an excellent position to promote good will for the entire organization. Flagmen should be ever conscious of these responsibilities when dealing with the traveling public.

An initial supply of these pamphlets has been sent to each District. However, additional copies may be obtained direct from this office. For more details and information regarding standard barricades, signing and flagging procedure, please refer to the Maintenance Manual.



Texas Highway Department
Form 483-B 1-51-40m

8866-151-40m

INTEROFFICE MEMORANDUM

TO: Mr. Fred T. Bennett, Engineer, Traffic Services

Date August 25, 1951

FROM: Ben J. Lednicky

Responsible

SUBJECT: Photographs of thrash can racks.

Desk ____________

Dear Mr. Bennett:

Herewith are several photographs showing a very serviceable and practical rack for holding thrash barrels in place in roadside parks.

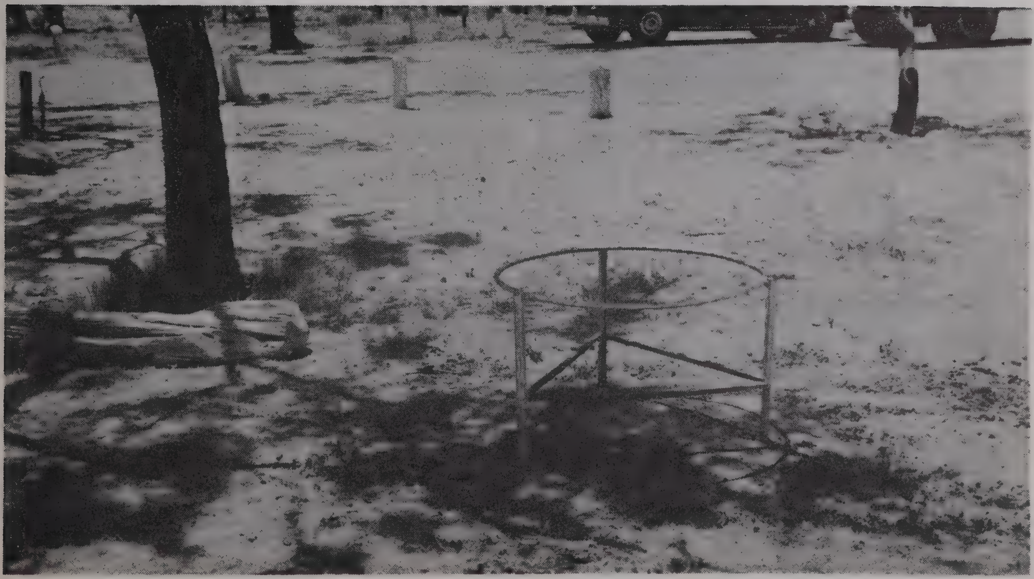
Districts 22 and 7 have adopted them as standard and both are highly pleased with them. From a "Safety First" point of view these 55 gallon drums should have handles welded on them for ease in emptying them. I did not appreciate this point until I ran across two men emptying the drums in the park east of Big Lake. Full of watermelon rinds the container weighed 400 pounds, and it was these men that pointed out how much a handle would mean to them.

These photos are simply for your information.

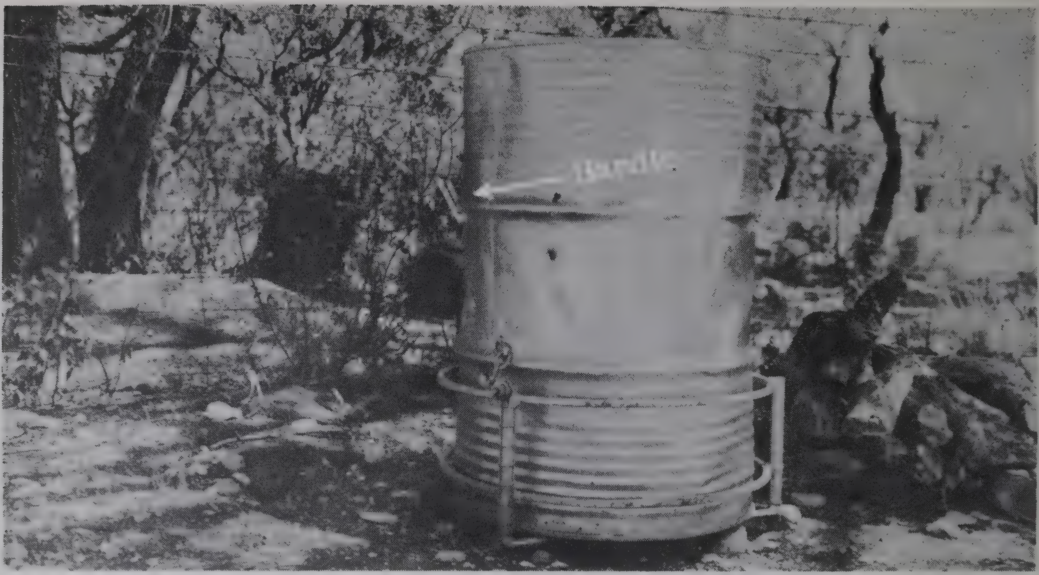
Sincerely yours

Ben J. Lednicky

Ben J. Lednicky
Sr. Landscape Adv.



Shop made metal rack for holding trash cans. They can be made from a variety of scrap metal found around the district shop. These racks are set in concrete.



Note chain for keeping can in rack. Some districts lock can to rack. Note handles welded to can -- very helpful for cleaning cans. A swinging davit could be placed on the back end of trucks to assist in the hoisting of cans heavily laden, especially with watermelons.

Note neat appearance of trash can in the metal rack. Holes in the bottom of cans allow juices and liquids to leak on the ground and then the air and sunshine dissipate the odor very readily. Keeping the cans off the ground makes for a far more sanitary condition than having them on the ground.

SALVAGE MATERIAL . . .

End view of District 14's Filling Station built entirely of salvaged material.

Side view of District 14's Filling Station. Note service "with a smile."

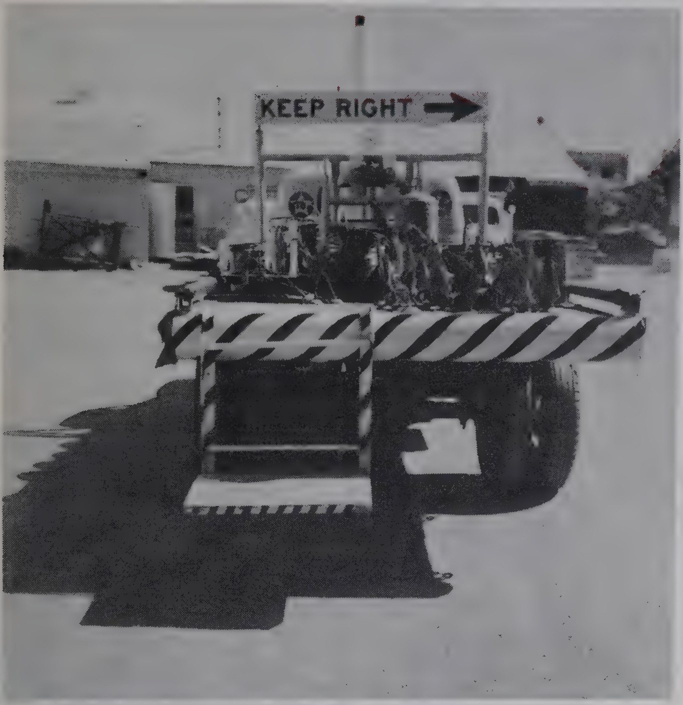
ABOUT THE DISTRICTS

PORTABLE EMERGENCY WELDING OUTFIT - DISTRICT 17

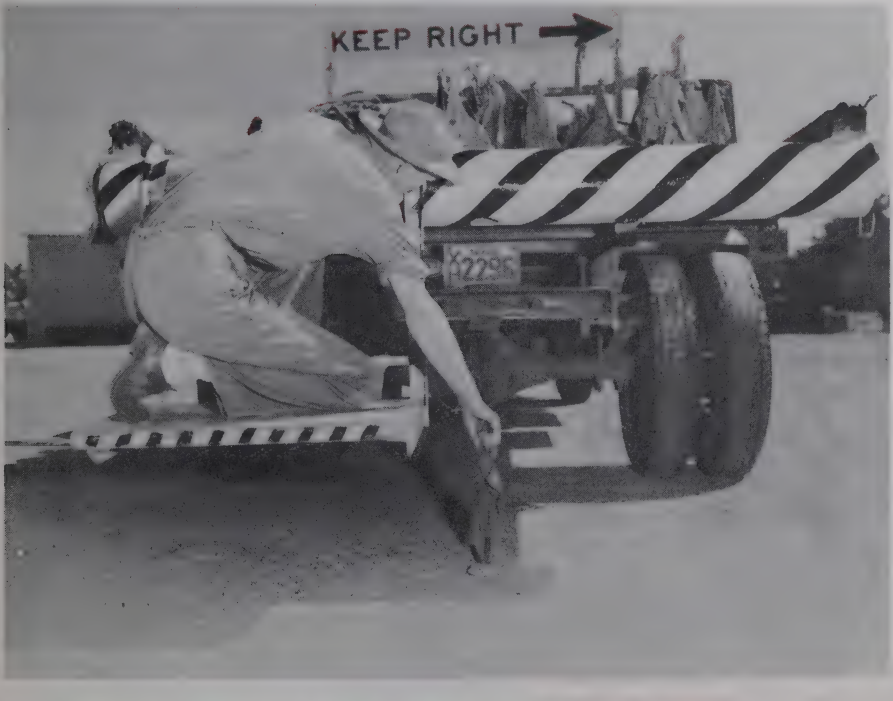
New portable emergency welding outfit in action at Camp Hubbard.

Emergency welding outfit in action - District 17.

DISTRICT 18's CENTER-STRIPING SERVICE TRUCK



Rear view of center-striping service truck - a la District 18.



Another view of District 18's center-striping service truck - in action.

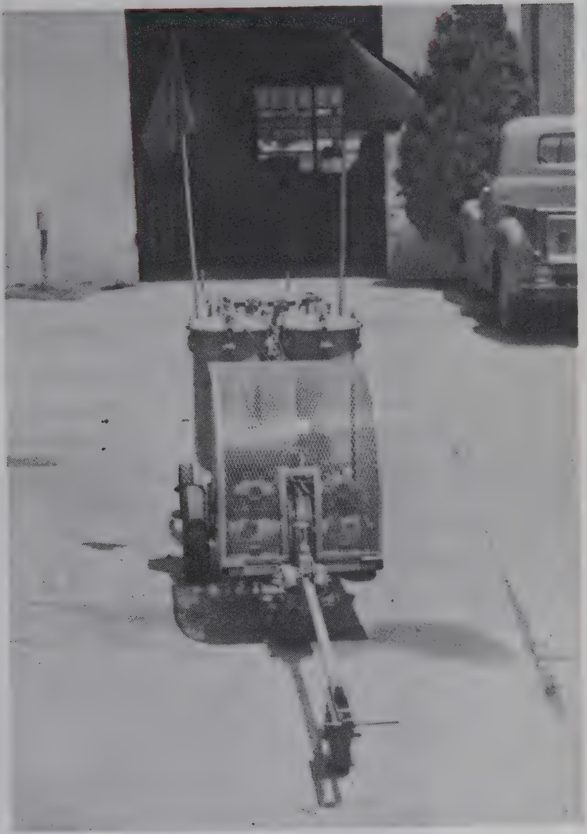
WAREHOUSE STOCK ROOM - DISTRICT 18

Section District 18 warehouse stock room.

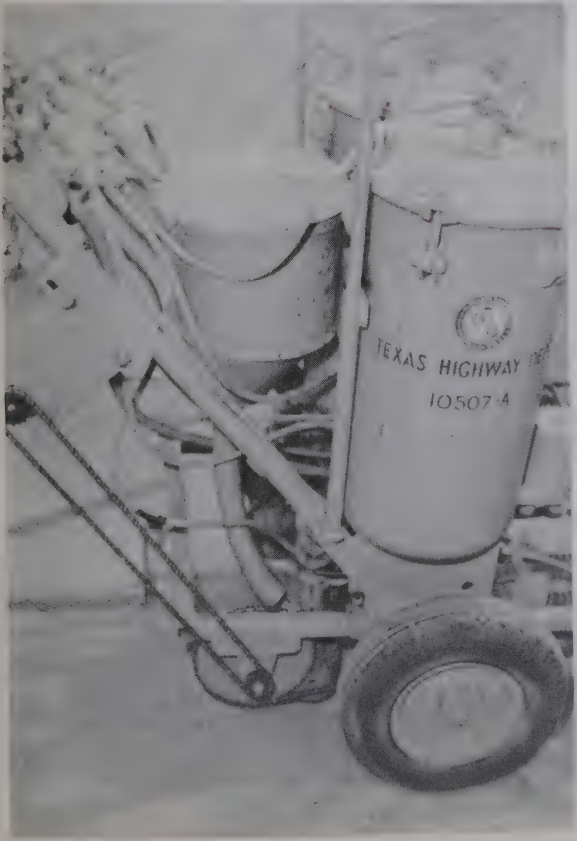
Service section of District 18 warehouse stock room.

Control card cabinet in District 18 warehouse.

DISTRICT 2's DUAL PAINT - STRIPING MACHINE

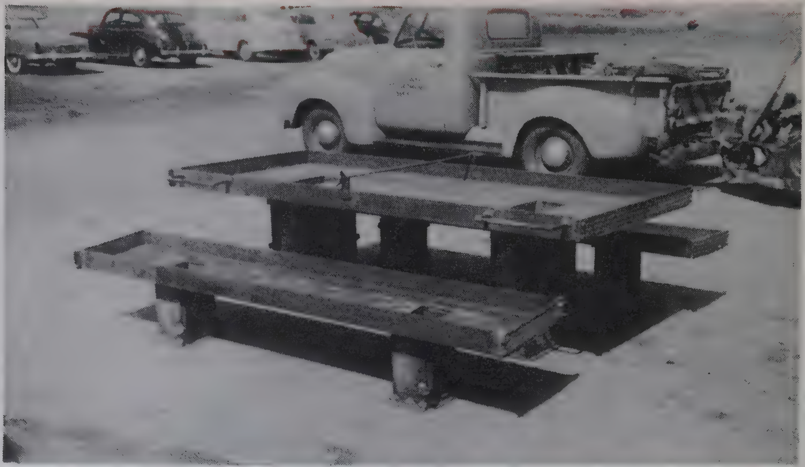


Front view of District 2's new dual paint - striping machine.

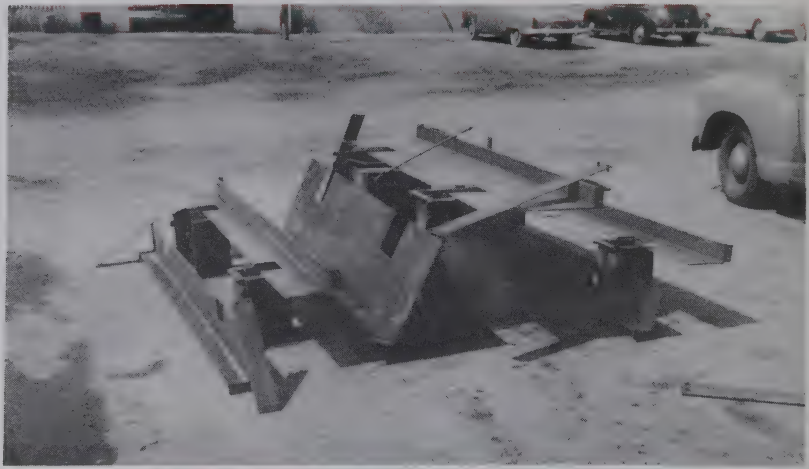


Close-up showing dual paint tanks, bead dispenser and control of District 2's new paint-striper.

NEW USE FOR OLD TRAFFIC PLATES – DISTRICT 25

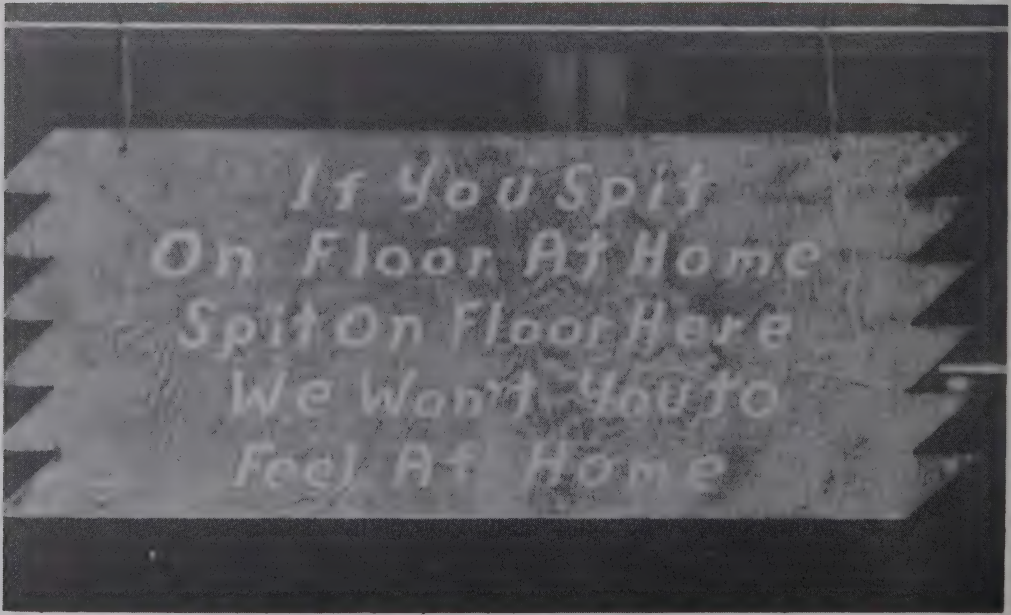


Collapsible steel forms for constructing roadside park tables and benches – welded design from old traffic plates – District 25.



Same forms "knocked down" for removal to new location – District 25.

MAKE YOURSELF AT HOME, PARDNER . . .



These signs are hung from the ceiling in District 20 headquarters shop.

"Comments From the Traveling Public"
OVER THE HIGHWAYS

. . . About 11:30 A. M. last Friday, August 17, 1951, while passing the Texas Highway Department mud-jacking crew working on the concrete pavement on Highway . . . , just east of the . . . . River, the machine blew out and literally covered my automobile with the substance used which was very difficult to remove due to asphalt and oil in the mud used and the pressure under which it was being used.

Truck numbers used in doing the work were Chevrolet truck Number . . . and Chevrolet truck Number . . . , also a GMAC truck Number . . . all from District . . . , ... , Texas.

Attached is a pencil written note signed by . . . . . , the foreman on the job. The cost of cleaning and waxing my automobile amounted to $15 and shall appreciate your letting me have check in that amount as reimbursement as I am going to try to get by without a complete paint job.

Signed . . .

* * *

. . . I had another occasion today to use one of those highway maps your organization puts out.

This time, I'm not going to let the idea grow cold on me:

That's the finest map I ever saw, and like thousands upon thousands of others, I appreciate very much the fine job you people do on it.

Clint Pace
Dallas Morning News
Dallas, Texas

* * *

. . . Roads too narrow. Need three and four lanes on main highways. Roads near large cities in very poor repair. Roads through large cities extremely rough . . .

Escondido, California

• • •

. . . On the afternoon of July 3rd, 1951 I went from ...... to ...... At about 3:30 P.M., some few miles south of .... I met a highway sweeping machine on the south side of one of those rather high elevations. The sweeping machine was on my side of the highway and when it came over the hill there was nothing for us to do but turn to the left to pass it. As we passed the machine showered my Pontiac with gravel and rocks and cracked the right windshield in two places and the left vent glass in one place.

We stopped and talked with two of the men on the sweeping machine. They were Mr. ...., the flagman, and Mr. .... who was on the truck. They told us that the driver was Mr. ..... and that the machine was out of ......, where Mr. .... is section foreman.

As the machine topped the hill we were only a short distance away and the flagman was waving a flag from the top of the machine, which he said was to motion us by to avoid the rocks. Of course, we did not know that the rocks were so large and in fact there was nothing to do anyway except to turn to the left to pass the machine, which we did with some fears of an oncoming car because of the hill. After talking to the men we drove on and a short distance further saw three highway workers knocking the larger rocks from the highway, some of which were as large as hen eggs.

Now, the Pontiac people here say that these breaks will at least become discolored and that they will likely split out in several directions. Their estimate to replace the windshield is $27.50, and the vent, $5.20, making a total of $32.70. Of course, this should be paid by the Highway Department and I will thank you to give me your reaction in the matter.

Signed . . .

• • •

. . . I was shocked at your highways. Their condition was bad enough, but their width was unforgivable. I do not believe they are adequate for the traffic load they carry . . .

Sacramento, California

• • •

. . . This afternoon (Sunday) at 2:30 I was coming west on the ... Highway when an unattended highway truck threw gravel into my windshields and broke them.

I called your man here, ... and was told very nasty that I had no business getting in the way and the highway department couldn't build roads if the public insisted in ignoring warnings and signs and getting in the way.

I worked for the highway department in Louisiana for five years and can readily understand his feeling about the public and work mixing but the only sign on the road is the one that says "END CONSTRUCTION" at the beginning of the .... road where the state is rebuilding the ..... highway and another small one saying drive carefully, loose gravel. It said nothing about crews, in fact the end construction sign should have meant just that. The road is bleeding badly and they were spraying it with gravel from trucks that had no type of warning device. I met this truck going east right down the middle of the road and pulled to the side of the road to avoid being hit and as it passed I noticed it was a highway truck with only the driver and although I was off the pavement the gravel broke both my windshields and I think I should not only have them replaced, but your men here should be instructed to remember that they are not little Hitlers just because they hold a little local authority and there should be some type of barrier to stop or at least warn the public of road construction. Had I been going the legal speed of 60 I would have killed my wife and five children all because of local carelessness . . .

Signed . . .

●●●

. . . Highway directive signs are hard to follow in some towns . . .

Arlo H. Rogers
Charlotte, Michigan

●●●

. . . Last Sunday I stopped at your Orange station to ask for a Texas road map. Your attendant there was so courteous and helpful that afternoon that I had to write you and tell you that I'm proud to have him welcoming tourists to Texas. His kindness must make many friends for our state . . .

E. R. Hawes
Port Arthur, Texas

●●●

. . . We drive a Nash and sometimes sleep in the car. Your roadside parks are very nice to stop in. I suggest you put a garbage can near each table instead of one per park. Maybe then people would throw their trash in them.. . .

Mrs. Howard L. Allen
Kansas City, Missouri

•••

. . . The roads were in fine condition. We enjoyed the woods along the roadside, and surely hate to see that such large areas of trees are dying. Is anything being done to prevent it? . . .

Mrs. R. J. Miller
Wheat Ridge, Colorado

•••

. . . I have just returned from a five week tour of the west and I would like to let you know that I am proud I am a Texan. The highways in New Mexico, Utah, California, Nevada, Arizona and Colorado are good; but they lack one thing we have in Texas and that is the wonderful roadside parks. Even in the panhandle where it is so hard to grow trees there is to be found the roadside park with its trees. I have found out why we do brag. If we have something that is better than other states we have a right to brag.

However, we often brag without giving credit where it is due. I had never thought of this before I went on my trip; but I have a feeling that the Highway Department of this state must be a very good department and it must be honest and working for the good of its people.

Miss Kathleen Gonzales
San Antonio 7, Texas

•••

. . . On the highways mark your road in white not black. Street signs in cities very inadequate. Lack of highway signs giving distances to cities . . .

Los Angeles, California

•••

. . . Good Roads! I liked your way of making road repairs so that driving can continue without unpleasant detours . . .

Evansville, Indiana

•••

IN MEMORIAM

This page of the Construction and Maintenance Bulletin is dedicated to the memory of the late

CHARLES D. DeSHAZOR
JACKIE D. SHELTON

Charles D. DeShazor was instantly killed when run over by a truck on July 24, 1951, while working as an inspector at a batching plant on the Gulf Freeway at Houston.

Jackie D. Shelton was injured fatally when struck by an automobile on August 31, 1951, while working as a rodman in a party of four taking cross sections of U. S. Highway 75 near Sherman.

In another of its many efforts to combat this serious hazard to our workers posed by traffic, the Department recently issued a small booklet of instructions to flagmen.

Protection of life is a task worthy of our best efforts, and so difficult of attainment that it will take the full cooperation of every employee to succeed.